

ANNUAL REPORT 2019

Public Health Child Fatality Review Program



Kentucky Department for Public Health
Division of Maternal and Child Health

November 2019



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EXECUTIVE SUMMARY

The Kentucky Department for Public Health established the State Child Fatality Review Team in 1996. The team is a voluntary, multidisciplinary body created to facilitate and develop local child fatality review teams to analyze data, identify trends, risk factors, and formulate recommendations for prevention measures. The annual report was prepared and submitted in accordance with Kentucky Revised Statute 211.684. Cases for review are identified through data from the Kentucky Office of Vital Statistics. The 2019 annual report presents information on child deaths occurring in the 2017 calendar year, and uses the terms mortality and death interchangeably. When available, the report includes trend data from 2013-2017.

There were 601 child deaths in Kentucky in 2017. The Kentucky mortality rate of 59.4 deaths per 100,000 children exceeded the US rate of 49.8 deaths per 100,000 children. Child deaths occurred in two groups: infants (less than one year of age) and children (1-17 years of age). Infant deaths comprised 62% of all child deaths. Eighty-six percent (86%) of infant deaths are non-injury related, and 60% of child deaths are due to injuries.

Infant Mortality

The five leading causes of infant mortality in 2017:

There were 370 infant deaths (6.8 deaths per 1,000 live births) in 2017. The rate is approximately 15% higher than the US rate (6.4 deaths per 1,000 live births).

Infant mortality rate in black infants (10.7 deaths per 1,000 live births) is almost twice as high as the infant mortality rate in white infants (6.4 deaths per 1,000 live births). Prematurity-related conditions were the leading cause of infant mortality in Kentucky, increasing by 6% since 2016. Nationally, prematurity is the second leading cause of infant mortality. The number of sudden unexpected infant deaths in Kentucky decreased from 101 in 2016 to 82 in 2017. Ninety-five percent (95%) of these deaths had at least one unsafe sleep factor noted from case investigation, re-enactment, and record review. Birth defects contributed to approximately 20% of infant deaths (1.5 deaths per 1,000 live births). Nationally, birth defects are the leading cause of infant mortality.

1	Prematurity-related conditions
2	Sudden unexpected infant death
3	Birth defects
4	Perinatal conditions
5	Homicide

Child Mortality

The five leading causes of child mortality in 2017:

There were 231 deaths among Kentucky children 1-17 years of age. (24.2 deaths per 100,000 children) in 2017. The rate is approximately 18% higher than the US rate (20.5 deaths per 100,000 children).

Black children are 1.7 times more likely to die than white children. The mortality rate among black children in Kentucky was 37 deaths per 100,000

1	Motor vehicle collisions
2	Homicide
3	Suicide
4	Cancer
5	Birth defects

children compared to 21 deaths per 100,000 white children. Child deaths due to motor vehicle collisions have declined by 39% since 2005. However, collisions remain the leading cause of injury-related death and are highest among children 15-17 years of age, which is consistent with the nation. The number of childhood homicides in Kentucky increased from 20 in 2016 to 34 in 2017. Approximately 50% of these homicides occurred by a firearm. Suicides contributed to approximately 10% of child deaths, with over 50% occurring by use of a firearm.

Homicide

- Child homicide deaths are the highest rate since 2012.
- Child homicides increased from 20 deaths in 2016 to 34 deaths in 2017.
- Firearms along with child abuse and neglect were the primary mechanisms for child homicide.
- Homicide by firearm is highest among children 15-17 years of age.
- Homicide by child abuse and neglect is highest among children less than 5 years of age.
- Black children are more likely to die from homicide (9.2 deaths per 100,000) compared to white children (2.4 deaths per 100,000).

Suicide

- Child suicides nearly doubled from 2014 to 2015 and continues to remain high with 24 suicides in 2017.
- Over half of child suicides involved the use of a firearm.
- Suicide by firearm is more prevalent among children 10-14 years of age (67%) compared to children 15-17 years of age (60%).
- Sixty percent (60%) of suicides among children 15-17 years of age are firearm-related and the remaining 40% are related to hanging/strangulation.
- White children die at a greater rate due to suicide (2.5 deaths per 100,000) compared to black children (1.8 deaths per 100,000).

Drowning

- An average of 12 children die annually from unintentional drowning.
- 58% of the 2017 drowning deaths occur among children under 5 years of age.
- Tub drownings are highest among infants.
- Pool drownings are highest among children 1-4 years of age.
- Natural water drownings (e.g., rivers, lakes, creeks) increase with age of children.

Poisoning

- Poisoning deaths are low with only two child deaths in 2017.
- Poisonings are not isolated to young children.
- In 2017, all childhood poisoning deaths occurred in children 15-17 years of age.
- Poisoning deaths were related to drug/alcohol overdose.

Fire

- There were three child deaths related to fire in 2017.
- All of these fire-related deaths occurred among children under 5-9 years of age.

RECOMMENDATIONS

Data Informs Actions

Data and case reviews inform state recommendations for prevention efforts to address child abuse and neglect, mental health issues, substance use disorder, and child deaths. The Kentucky Child Fatality Review Program will continue to collaborate with local and state partners to prevent injury and death of Kentucky's children.

2020 Recommendations

Promote education for safe storage of firearms to reduce accidental deaths.

Promote safe storage of medications and poisons to reduce accidental ingestions by children.

Promote and expand creative outreach and education of safe sleep in communities.

Promote *Keeping Infants Safe* curriculum in school systems.

Promote education for appropriate seatbelt and car seat use.

Promote suicide prevention activities and community collaboration to reduce child suicides.

Promote water safety to reduce the number of children drowning.

Continue education, outreach, and support for local child fatality review teams to improve the quality of the review and to increase the number of teams implementing prevention activities.

INTRODUCTION

Kentucky Department for Public Health's Child Fatality Review Program serves to decrease child deaths through prevention efforts. Aggregate data from the Kentucky Office of Vital Statistics is reviewed to identify trends and emerging issues related to fatalities in Kentucky. The information and data from the child fatality review provides recommendations for prevention of future injuries and child deaths.

The Child Fatality Review Program has the following functions:

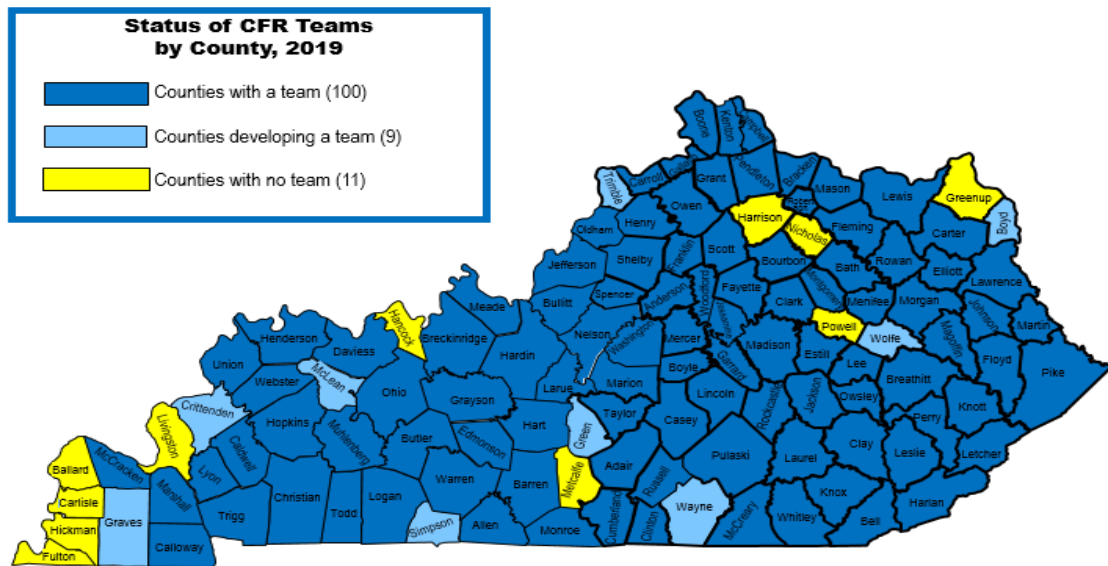
- Facilitate and develop local child fatality review teams.
- Develop and distribute model protocols for local child fatality review teams.
- Review and approve protocols submitted by local child fatality review teams.
- Analyze data to identify trends, patterns, and risk factors.
- Evaluate the effectiveness of prevention and intervention strategies.
- Develop recommendations for state programs, legislation, administrative regulations, policies, budgets, and service standards for the development of strategies for the prevention and reduction of child deaths.

Kentucky Revised Statute 211.686 requires the composition of local child fatality review teams to include multidisciplinary representation from coroners, law enforcement, local health departments, Department for Community Based Services, commonwealth and county attorneys, medical professionals, and others deemed vital to carry out its purpose.

Kentucky Revised Statute 211.686 states the coroner is responsible for calling together the local child fatality review team to gather information to determine the most accurate manner and cause of a child's death. Team members share information, discuss and prioritize child health and risk factors, and promote education and community-based prevention programs. The Child Fatality Review Program strives to develop an active team in every county to implement initiatives for injury prevention. Kentucky added the 100th child fatality review team in 2019. Only six teams were active and conducting comprehensive reviews in 2017. By conducting reviews at the local level, policy or system level changes are completed to expand the depth of prevention activities. Twenty-two teams were provided technical assistance and became active in 2018 (Figure 1).

Kentucky Revised Statute 211.684 requires the Child Fatality Review Program to prepare an annual report that includes a statistical analysis of number and causes of child fatalities. The trend analysis of data from 2013-2017 will focus on opportunities for prevention. Information from the 2017 Kentucky Office of Vital Statistics contains the most completed year of data available for analysis. Preliminary data and numbers are subject to change. The state child fatality review team reviewed the data and recommendations presented in this report. Details of 2018 prevention efforts are available later in this report.

Figure 1. Status of Child Fatality Review Teams by County (2019)



Data Sources

Data in this report are for Kentucky residents from birth to 17 years of age from 2013 through 2017. The sources of this data include Office of Vital Statistics death certificate files, coroners' reports, child fatality review team reports, Kentucky Medical Examiner's reports, and Kentucky Medicaid Claims Data Warehouse. Population data used to determine death rates were obtained from Office of Vital Statistics birth certificate files and the Kentucky State Data Center. Causes of death are classified based on the International Classification of Diseases 10th revision (ICD-10). Data presented in this report were obtained from sources documented in the References section of this report, including the National Vital Statistics Reports published by the National Center for Health Statistics and the Centers for Disease Control and Prevention.

Analytic Methods

Data are presented in the form of a count, percentage, rate, or three-year rolling average for various causes of death by age group. Rates are used to relate the number of cases of a disease or the size of the source population in which they occurred. A rate is a ratio in which there is a distinct relationship between the numerator and denominator with some measure of time included.

The **infant mortality rate** is an estimated number of infant deaths per 1,000 live births over a period of time.

$$\frac{\text{Total number of infant deaths} \times 1,000}{\text{Total number of live births}}$$

A **childhood mortality rate** is an estimated number of child deaths per 100,000 children over a period of time.

$$\frac{\text{Total number of child deaths} \times 100,000}{\text{Total number of children in the population}}$$

A three-year rolling average increases the number of deaths to smooth the trend skewed by outliers.	<u>Total number of deaths in 2013, 2014, and 2015</u> 3
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Definitions

There is a specific methodology used to classify a cause of death as either a prematurity-related condition or sudden unexplained infant death.

For a death to be classified as a prematurity-related condition, the infant (less than 1 year of age) must be born before 37 weeks gestation with the cause of death assigned to one of the following ICD-10 codes:

K55.0	Acute vascular disorders of the intestine	P22.0-.9	Respiratory distress of newborn
P00.0	Newborn affected by maternal hypertensive disorders	P25.0-27.9	Interstitial emphysema and related conditions originating in the perinatal period;
P01.0	Newborn affected by incompetent cervix	P26	Pulmonary hemorrhage originating in the perinatal period
P01.1	Newborn affected by premature rupture of membranes	P27	Chronic respiratory disease originating in the perinatal period
P01.5	Newborn affected by multiple pregnancy	P28.0	Primary atelectasis of newborn
P02.0	Newborn affected by placenta previa	P28.1	Other and unspecified atelectasis of newborn
P02.1	Newborn affected by other forms of placental separation and hemorrhage	P36.0-.9	Bacterial sepsis of newborn
P02.7	Newborn affected by chorioamnionitis	P52.0-.3	Intracranial nontraumatic hemorrhage of newborn
P07.0-.3	Extremely low birth weight newborn	P77	Necrotizing enterocolitis of newborn
P10.2	Intraventricular hemorrhage due to birth injury		

To be classified as a sudden unexplained infant death, the death must occur only among infants and the cause of death assigned to one of the following ICD-10 codes:

R95	sudden infant death syndrome
R99	accidental suffocation in bed
W75	undetermined
W83	other specified threats to breathing
W84	unspecified threat to breathing

Limitations

Death certificate data has certain limitations and should be understood when interpreting results. The timeliness and accuracy of completion of the death certificate are limitations. Clinical interpretation of

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causes of death may differ, which can lead to variation in identifying the primary cause of death. Determining a single, specific underlying cause of death among decedents with multiple chronic diseases can be problematic since the sequence of disease may be unclear. One single condition may not cause death. For injury-related causes of death (e.g., homicides, suffocation, and suicides), investigations can be lengthy and delay the determination of the primary cause of death. Categorization of death is based on the primary cause of death and does not include supplemental causes of death. This could lead to under-reporting of certain causes of death. For example, a preterm infant with a congenital heart defect may have prematurity listed as the primary cause of death and congenital anomalies listed as a supplemental cause of death. Since this report is based only on the primary cause of death, this infant would be categorized as a prematurity-related death and not as a death related to congenital anomaly.

Delay in receiving official death certificates of Kentucky residents that die out-of-state is another limitation of this data. Analysis is based solely on the records housed in Kentucky's Department for Public Health Office of Vital Statistics. If data on residents that die out-of-state have not been received prior to analysis then these deaths are not included. The out-of-state deaths reported prior to the analysis have an "Undetermined" cause of death. In previous annual reports, these cases were categorized as "Missing/Unknown" for the cause of death. In 2017, the reported manner was used to categorize most of these deaths into the larger categories of "Injury" and "Non-injury", resulting in a decrease of the number of deaths in the "Missing/Unknown" category. Additional information from the birth records and the birth defect surveillance system was obtained for the 2017 out-of-state natural infant deaths to determine if there was adequate evidence to classify these deaths as due to birth defects or prematurity-related conditions. As a result, the number of deaths in those two cause categories increased. For the reasons listed above, the data presented in this report are preliminary and may change.

Many figures throughout this report contain data based on small numbers. Rates and percentages based on small numbers are unreliable due to random error. Minimal increases or decreases in these numbers from year to year may dramatically affect the rate or percent resulting in what appears to be a significant change. However, the differences in the data from year to year are not statistically significant and should be interpreted with caution.

CHILDHOOD DEATHS

In the United States, approximately 37,000 deaths occur annually among children 0-17 years of age¹ with a little over 600 of these deaths occurring among Kentucky children (Table 1). Deaths among Kentucky's infants and children have fluctuated from year to year. The trend remains stable as the fluctuations are likely due to random variation in the data.

Table 1. Childhood Death by Age Group and Year (2013-2017)

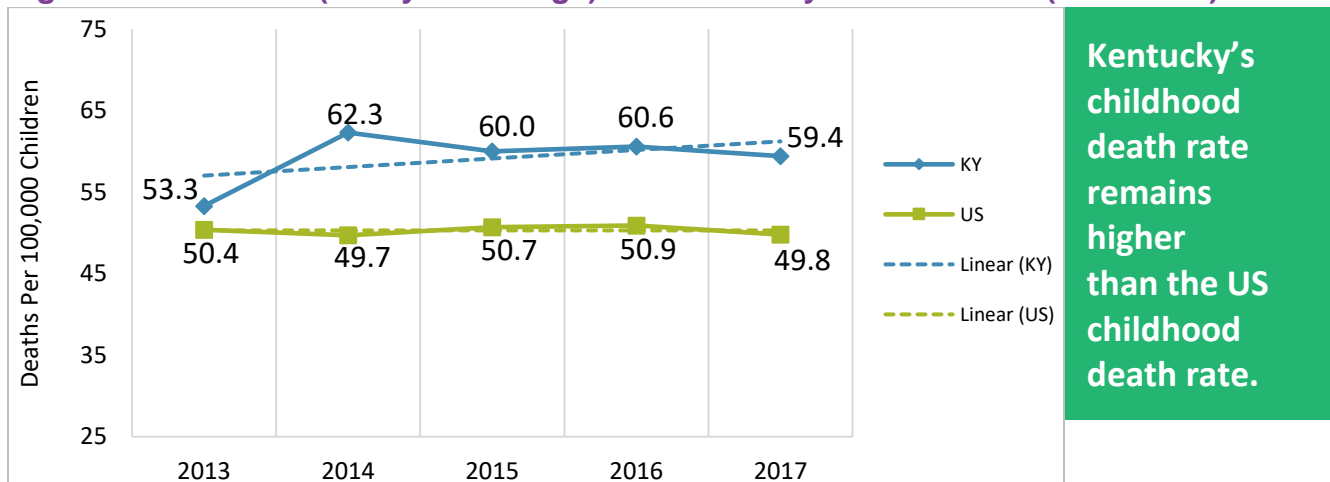
Age Group	2013	2014	2015	2016	2017
Infants (<1 year)	364	419	380	372	370
1-4 years	60	53	69	66	50
5-9 years	35	48	37	39	39
10-14 years	48	47	55	54	52
15-17 years	35	65	66	81	90
Total	542	632	607	612	601
Childhood Death Rate per 100,000	53.3	62.3	60.0	60.6	59.4

Note: 2013-2017 data are preliminary and may change.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017; Kentucky State Data Center, Population Estimates 2013-2017. Additional infant deaths identified through KY Medicaid Claims Data Warehouse for Years 2013-2017.

The death rate is the number of deaths adjusted for the population of children in the age group. In 2017, Kentucky's childhood death rate was 59.4 deaths per 100,000 children compared to 60.6 deaths per 100,000 children in 2016. With the exception of 2013, Kentucky's childhood death rate from 2013-2017 remained approximately 20% greater than the US rate (Figure 2). The 2013 Kentucky data presented throughout this report may be an underrepresentation of the actual deaths that occurred among Kentucky's children that year, due to missing out-of-state death records.

Figure 2. Childhood (0-17 years of age) Death Rate by Year of Death (2013-2017)



Note: 2013-2017 data are preliminary and may change.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017; Kentucky State Data Center, Population Estimates 2013-2017; Additional infant deaths identified through KY Medicaid Claims Data Warehouse for Years 2013-2017; Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2017 on CDC WONDER Online Database, released December 2018. Data are from the Multiple Cause of

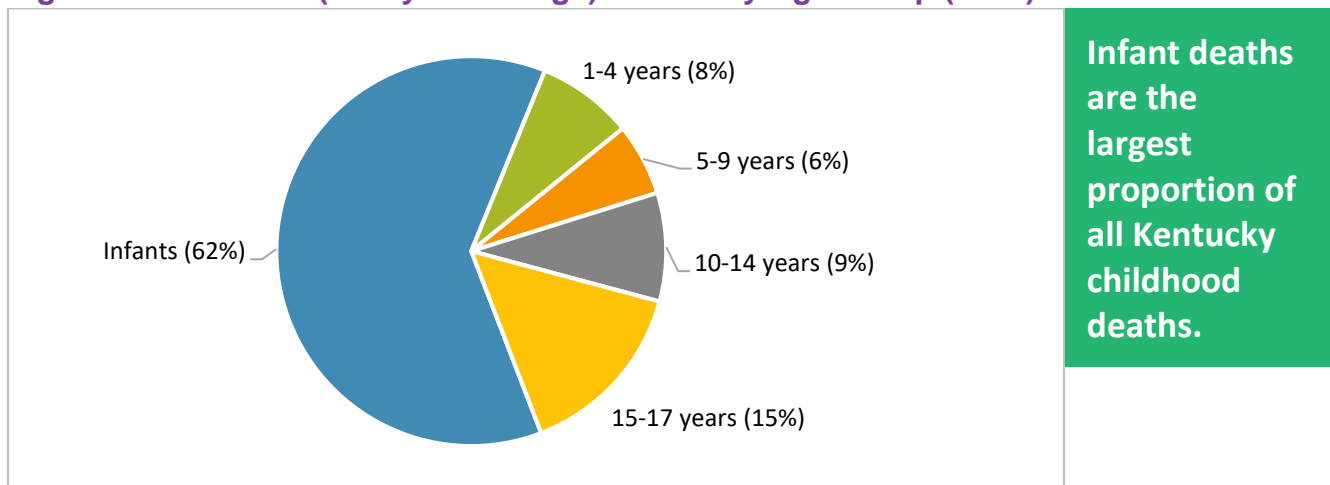
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Death Files, 1999-2017, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/ucd-icd10.html> on Jul 10, 2019 9:47:32 AM.

There could be many contributing factors for Kentucky's childhood death rate to be greater than the US rate. One major contributing factor is Kentucky's high infant mortality rate. Kentucky has the 16th highest infant mortality rate amongst all states.²

In the US and in Kentucky, the largest number of child deaths (birth through 17 years of age) occur among infants (less than 1 year of age). In 2017, there were 370 infant deaths, representing 62% of all deaths occurring among Kentucky's children (Figure 3). The 15-17 year age group represented the second largest proportion of all childhood deaths with 81 deaths (11%). Infant death causes greatly differ from causes of death among children older than 1 year of age. The majority of infant deaths are due to Sudden Unexplained Infant Death (SUID), prematurity, or other medical conditions. However, the majority of deaths among children 1-17 years of age are due to injury-related causes, such as motor vehicle collision. Injury-related causes of death are important because they have the greatest potential for prevention or reduction in the number of deaths.

Figure 3. Childhood (0-17 years of age) Deaths by Age Group (2017)



Note: 2017 data are preliminary and may change.

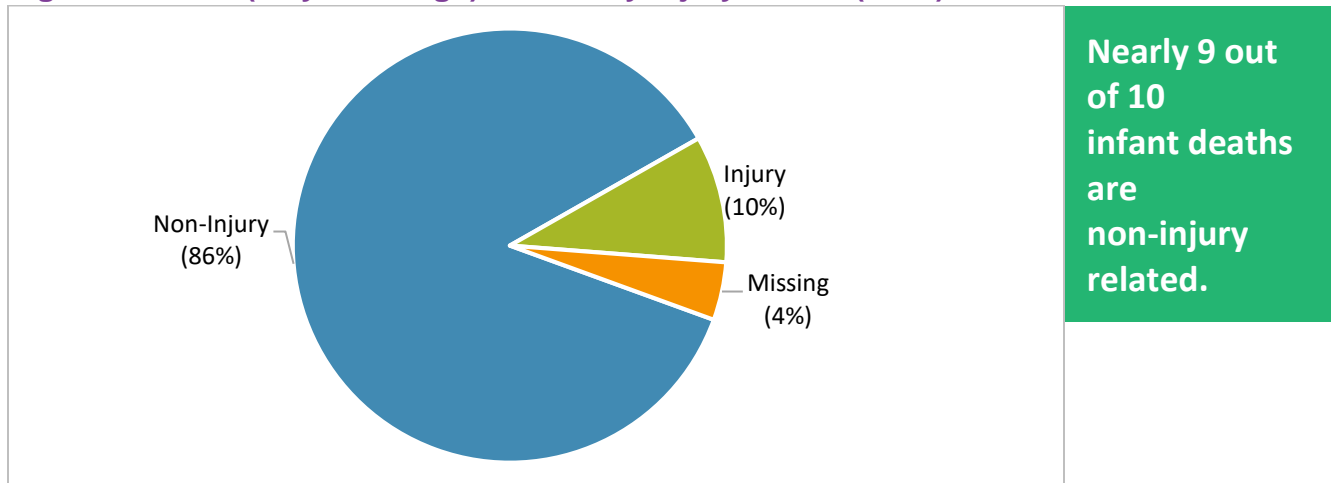
Data Source: Kentucky Vital Statistics, Death Certificate Files 2017. Additional infant deaths identified through Kentucky Medicaid Claims Data Warehouse for 2017.

The Centers for Disease Control and Prevention separates deaths into two major categories by cause of death: injury or non-injury. Deaths are grouped into these two broad categories because the contributing factors and prevention efforts for an injury death and a non-injury death differ greatly.

Non-injury deaths include causes of death that are the result of natural processes such as disease, prematurity, or birth defects. Non-injury deaths are more common in infants (Figure 4). Keeping infants safe and secure is of utmost priority. Children of different ages and development are at a greater risk for various preventable deaths due to injury. The leading causes of injury-related deaths in children are:

1. Motor vehicle collisions	4. Drowning
2. Homicide	5. Fire
3. Suicide	6. Poisoning

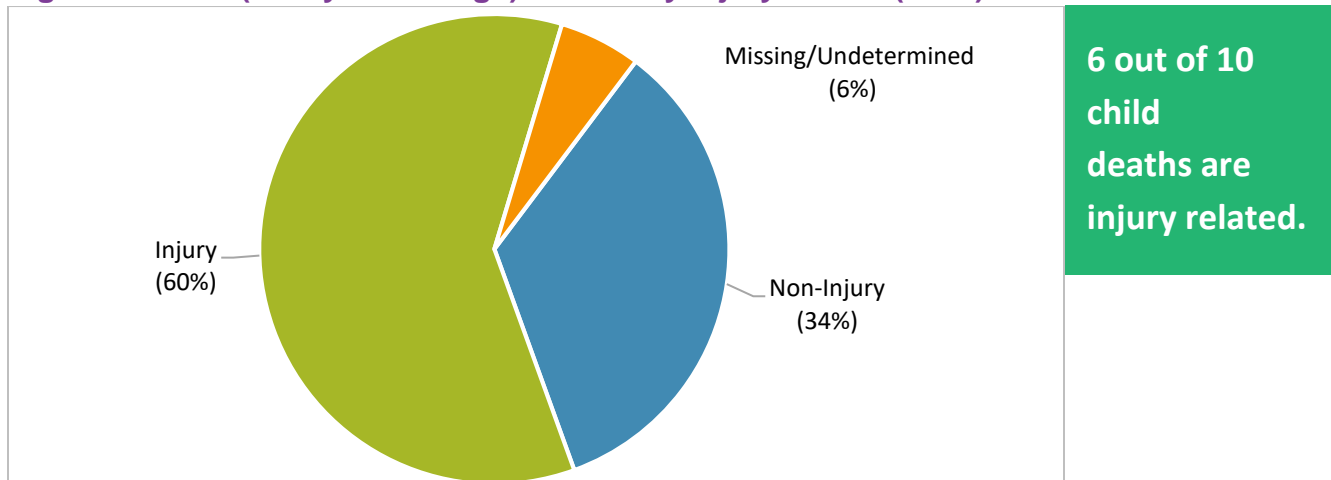
Figure 4. Infant (<1 year of age) Deaths by Injury Status (2017)



Note: 2017 data are preliminary and may change. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning. Injury includes deaths due to homicide, drowning, and poisoning. Those infants missing cause of death either died out-of-state or were identified through Kentucky Medicaid Claims and the cause of death was not available.
Data Source: Kentucky Vital Statistics, Death Certificate Files 2017. Additional infant deaths identified through Kentucky Medicaid Claims Data Warehouse for 2017.

Injury related deaths are more common in children over the age of one year and account for the majority of child deaths in Kentucky. This parallels national reports for unintentional injuries as the leading cause of death.

Figure 5. Child (1-17 years of age) Deaths by Injury Status (2017)

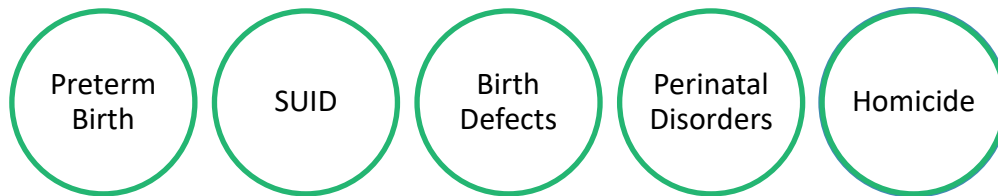


Note: 2017 data are preliminary and may change. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning. Those children missing cause of death or undetermined died out-of-state and the cause of death was not available.
Data Source: Kentucky Vital Statistics, Death Certificate Files 2017.

The causes of injury-related deaths are predictable, preventable, and controllable. Individual education for prevention must be developed with data-driven information addressing the developmental age of the child, the cause of death, and social determinants of health that may affect a child or family. Child death review at a local level is most effective since it is inclusive of the resources and barriers of the individual community.

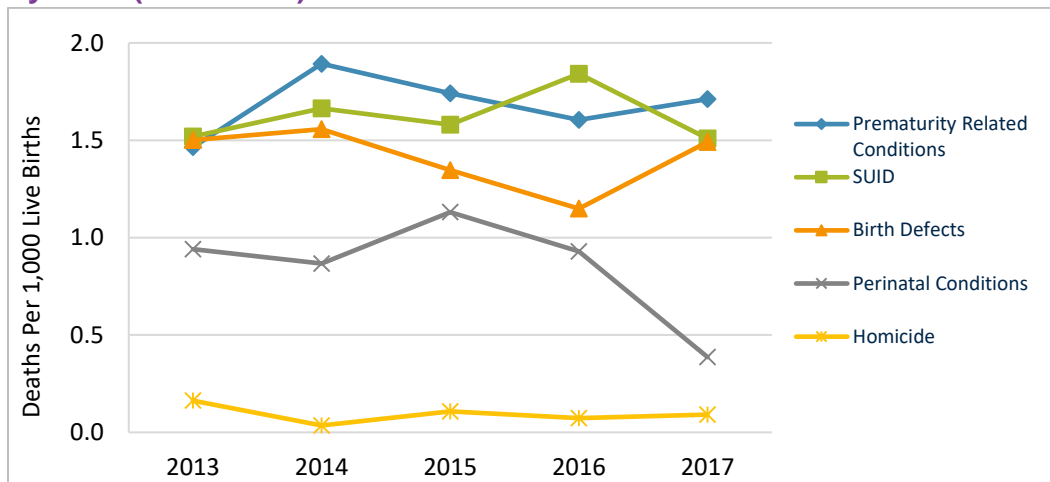
Figure 6 presents the trends in the five leading causes of infant death in Kentucky. In 2017, the five leading causes of death included prematurity (preterm birth) related conditions, SUID, birth defects, other perinatal conditions/disorders, and homicide.

Five Leading Causes of Infant Death



This differs from the US where the leading cause of infant death is due to birth defects followed by prematurity related conditions and then perinatal conditions.³ Deaths due to prematurity related conditions have historically been the leading cause of infant mortality in Kentucky, with the exception of 2016 when deaths due to SUID surpassed deaths due to prematurity.

Figure 6. Five Leading Causes of Infant (<1 year of age) Mortality per 1,000 Live Births by Year (2013-2017)



Note: 2013-2017 data are preliminary and may change.

Data Source: Kentucky Vital Statistics, Birth Certificate Files 2013-2017 and Death Certificate Files 2013-2017.

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In 2017, the five leading causes of child death included motor vehicle collisions, homicide, suicide, cancer, and birth defects.⁴ Three of these top five causes are potentially preventable.

Five Leading Causes of Child Death

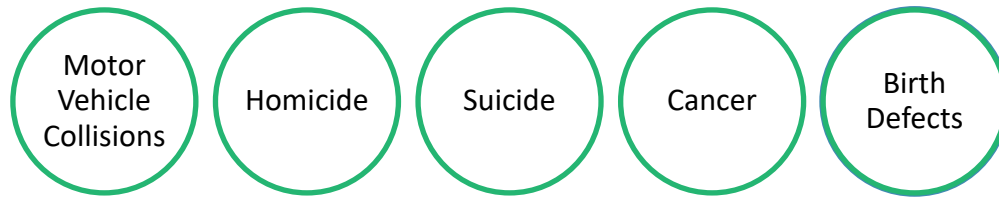
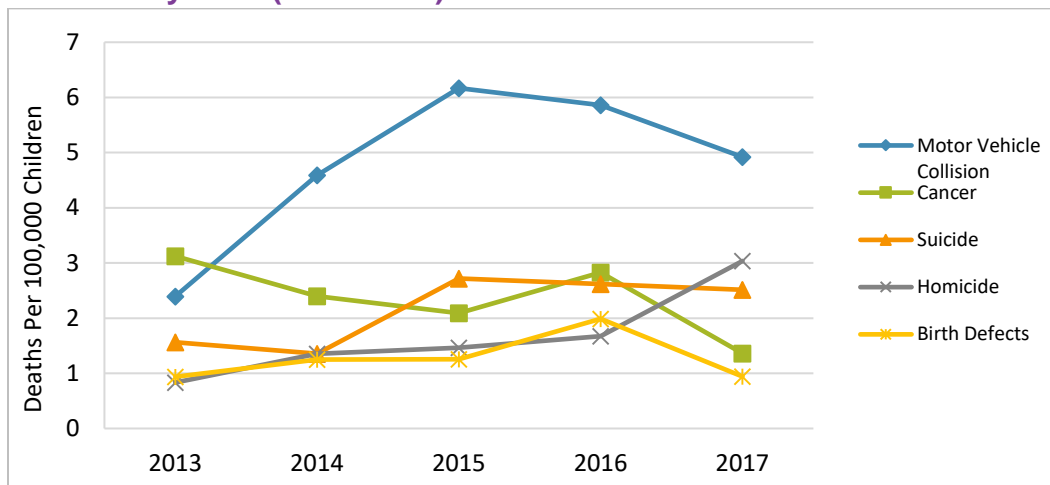


Figure 7. Five Leading Causes of Child (1-17 Years of Age) Mortality per 100,000 Children by Year (2013-2017)



Note: 2013-2017 data are preliminary and may change

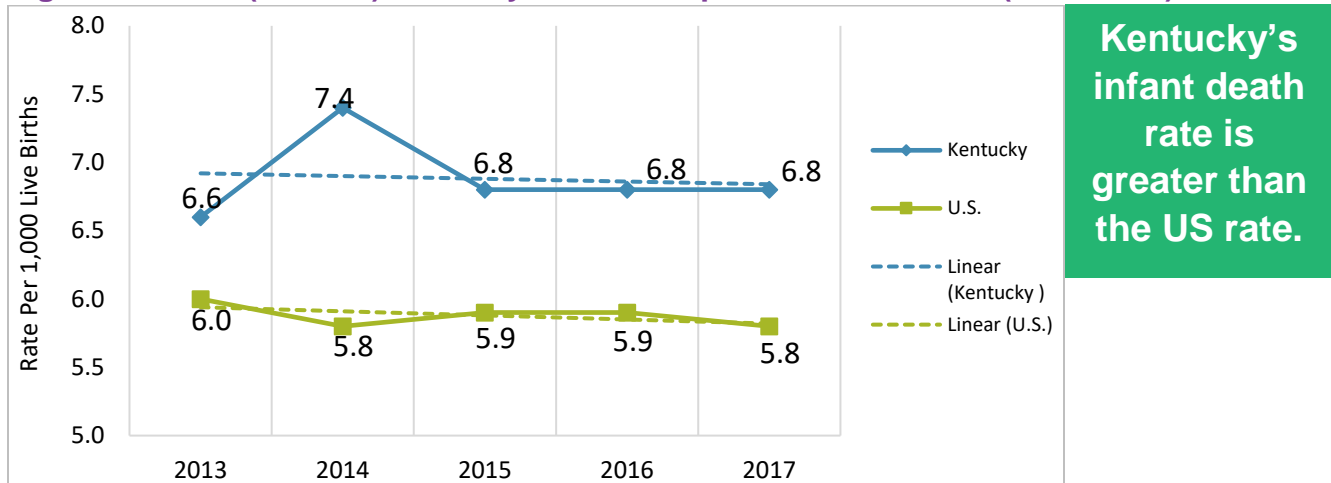
Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017; Kentucky State Data Center, Population Estimates 2013-2017.

Patterns in Kentucky Infant Deaths

The infant mortality rate is the number of infant deaths for every 1,000 live births, and is an indicator of a state's overall health, social, and economic environment. Kentucky's infant mortality rate (IMR) remains approximately 15% greater than the US. In 2017, Kentucky's infant mortality rate was 6.8 deaths per 1,000 live births compared to the US IMR of 5.8 deaths per 1,000 live births (Figure 8). Kentucky has the 16th highest IMR among states in the US.²

Many factors influence infant mortality. The factors include reproductive health, perinatal care, safe-sleep practices, birth defects, smoking, infections, and high-risk conditions. Reducing infant deaths requires collaboration of public health agencies, health care providers, communities, and other partners. Sections of this report provide an overview of the different causes of infant mortality in Kentucky and the multidisciplinary approaches taken to reduce these deaths.

Figure 8. Infant (<1 Year) Mortality Rates Compared to the Nation (2013-2017)



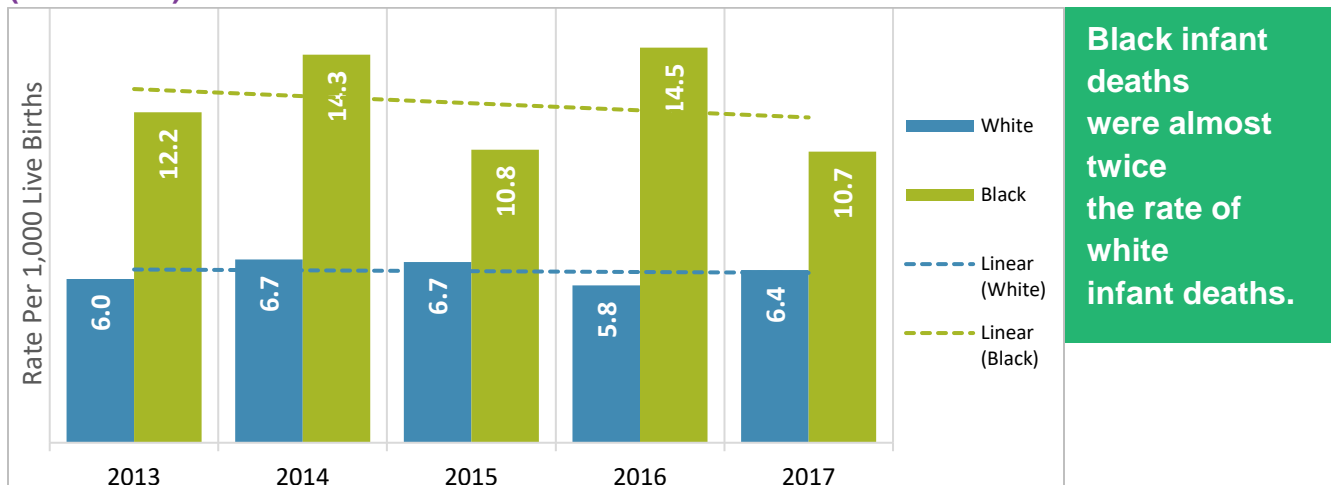
Note: 2013-2017 data are preliminary and numbers could change.

Data Source: Kentucky Vital Statistics, Death Certificate files, Years 2013-2017; Additional infant deaths identified through Kentucky Medicaid Claims Data Warehouse for Years 2013-2017; National Center for Health Statistics, Deaths Final Data 2017.

Racial Disparity among Infant Deaths

In the US and Kentucky, there are disparities in mortality among black and white children. In Figure 8, data shows black infants die at nearly twice the rate of white infants.⁵ Black infants are 3.2 times more likely to die from complications related to low birthweight compared to white infants. Mothers of black infants are 2.2 times more likely than white mothers to receive late or no prenatal care.⁵

Figure 9. Black and White Infant (<1 Year) Mortality Rates per 1,000 Live Births by Year (2013-2017)



Note: 2013-2017 data are preliminary and may change. Only black and white infant mortality rates are presented, regardless of ethnicity. All other races are excluded so rates presented do not equal Kentucky's overall infant mortality rate.

Data Source: Kentucky Vital Statistics, Birth Certificate Files 2013-2017 and Death Certificate Files 2013-2017

In 2017, Kentucky's mortality rate for black infants was 10.7 per 1,000 live births compared to 6.4 per 1,000 live births for white infants (Figure 9). Black infants were 1.7 times more likely to die than white infants. The disproportionate rate highlights the need for prevention efforts targeted toward Kentucky's black mother and infant populations. The five leading causes of death are the same for both black and white infants.

Prematurity-related Deaths

The time for a human baby to develop in the womb normally lasts 38-41 weeks. The duration is known as pregnancy gestation. The definition of preterm includes any baby born alive before 37 weeks of pregnancy.⁶ Based on gestational age, preterm birth is divided into sub-categories:

Extremely preterm	less than 28 weeks gestation
Very preterm	28 to 32 weeks gestation
Moderate to late preterm	32 to 37 weeks gestation ⁷

Deaths due to prematurity-related causes increased from 88 in 2016 to 93 in 2017. The majority of prematurity-related deaths occur among babies categorized as extremely preterm. From 2013-2017, over 80% of the infant deaths due to prematurity-related causes occurred among extremely preterm infants, and approximately 7% of these deaths occurred among very preterm infants.

Being born premature—even by just a few weeks—can increase the risk of complications and death.

- The number of adverse birth outcomes is smallest among babies born between 39 and 40 weeks of gestation.⁷
- Brain growth continues throughout pregnancy with 50% of cortical brain volume growth occurring between 34 and 40 weeks gestation.⁸
- At 37 weeks gestation, an infant's brain is only 80% the weight of a infant's brain born full term at 40 weeks gestation.⁸

This data supports early elective deliveries prior to 39 weeks should not occur. Infants born between 37 and 39 weeks are at an increased risk of the following:

- Neonatal intensive-care unit admissions
- Transient tachypnea (rapid breathing) of the newborn
- Respiratory distress syndrome
- Sepsis (life threatening infection)
- Feeding problems and other transition issues
- Infant mortality⁹

RISK FACTORS FOR PREMATURE BIRTH⁹

- ✓ Black race
- ✓ Mother's age (<18 or >35 years)
- ✓ Late or no healthcare during pregnancy
- ✓ Smoking
- ✓ Alcohol and illegal drug use
- ✓ Domestic violence
- ✓ Lack of social support
- ✓ Stress
- ✓ Exposure to environmental pollutants

Sudden Unexpected Infant Death (SUID)

SUID are deaths that occur:

- Suddenly and unexpectedly

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- During the first year of life
- Without a cause of death being immediately obvious prior to investigation.¹⁰

SUID deaths occur most often during sleep or in a baby's sleep area and include sudden infant death syndrome (SIDS), accidental suffocation/strangulation in a sleeping environment, and other infant deaths from unknown causes. A thorough investigation to determine the cause of death includes an autopsy, examination of the death scene, and review of the clinical history. A doll re-enactment is a useful tool for determining the infant's position when placed for sleep and when found.

Table 2. Number of SUID Cases by Type (2013-2017)

Type of SUID Death	2013	2014	2015	2016	2017
SIDS	55	57	55	51	31
Undetermined	20	26	21	32	28
Asphyxia	9	11	12	18	23
Total Number of SUID Cases	84	94	88	101	82

Table 3. Number of SUID Cases by Presence of Risk Factors (2013-2017)

Sleep-Related Risk Factors Present	2013	2014	2015	2016	2017
Sharing sleep surface at time of death	46	47	50	50	41
Surface not designed for infant sleep	56	67	64	68	50
Hazards in Sleep Area	48	52	57	84	56
Sleep Position (Prone or On-Side)	22	30	26	52	47
At Least One Risk Factor Present	75	89	80	96	79

Note: 2013-2017 data are preliminary and may change. Categories under the Sleep-Related Risk Factors are not mutually exclusive. Numbers may vary from the SUID Registry because cases that were categorized as "Excluded" by the Registry are not included in this report.

Data Source: Kentucky Vital Statistics, Death Certificate File 2013-2017; Coroner's Reports; Child Fatality Review Team Reports; and Kentucky Medical Examiner's Reports, 2013-2017.

SUID decreased from 101 cases in 2016 to 82 cases in 2017. The number of SUID cases classified as classic SIDS on the death certificate has decreased from 51 in 2016 to 31 in 2017 (Table 2). This decrease may be due to better death scene examination and death investigation.

The proportion of SUID cases with sleep-related risk factors present has remained high. In 2017, 96% of SUID cases had at least one unsafe sleep risk factor (Table 3).

Figure 10. Sleep-Related Risk Factors Present in 2017 SUID Deaths

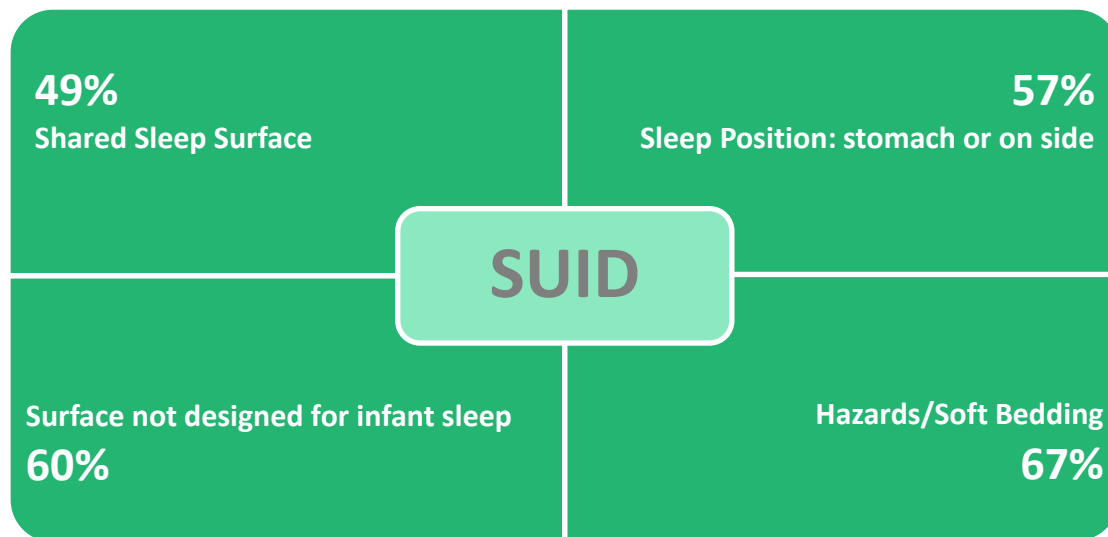
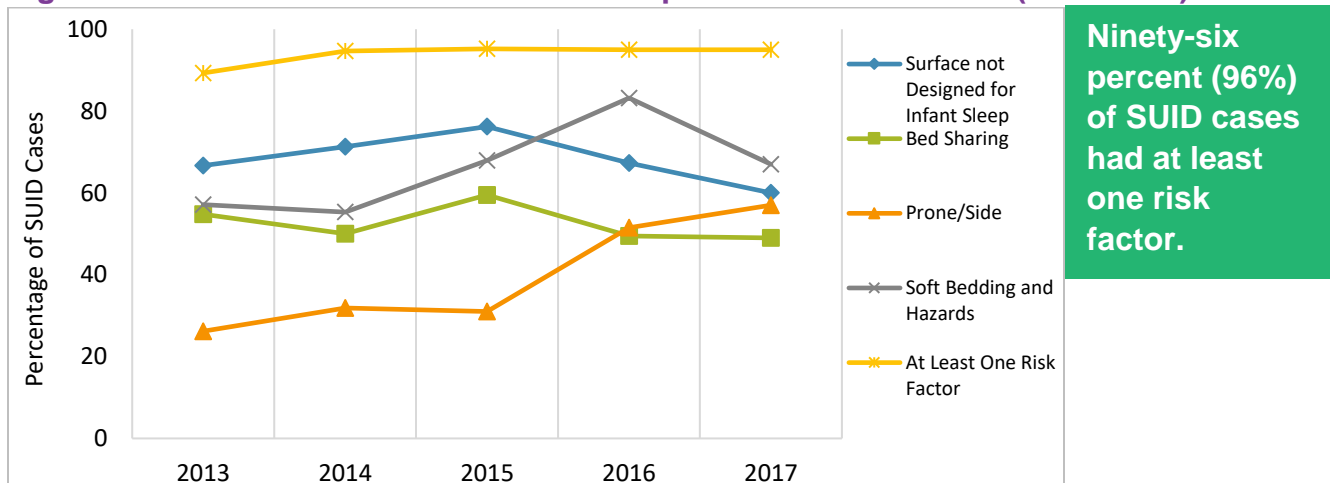


Figure 10 shows the percentage of Kentucky SUID cases with documented sleep-related risk factors. Every year since 2014, at least 95% of SUID cases had at least one documented risk factor present. In 2017, soft bedding or hazards in the sleep environment were the most common risk factor present. The presence of this risk factor has increased 17% since 2013. Surface not designed for infant sleep was the second most common risk factor present among SUID cases in Kentucky. This risk factor has slightly decreased (~11%) since 2013. Prone or side sleeping is another sleep-related risk factor that has increased among SUID cases in Kentucky, from 22 cases in 2013 to 47 cases in 2017.

Figure 11. Percent of SUID Cases with Sleep Related Risk Factors (2013-2017)



Note: 2013-2017 data are preliminary and may change. Categories under the sleep-related risk factors are not mutually exclusive. Numbers may vary from the SUID Registry because cases that were categorized as “Excluded” by the registry are not included in this report.

Data Source: Kentucky Vital Statistics, Death Certificate File 2013-2017; Coroner’s Reports; Child Fatality Review Team Reports; and Kentucky Medical Examiner’s Reports, 2013-2017.

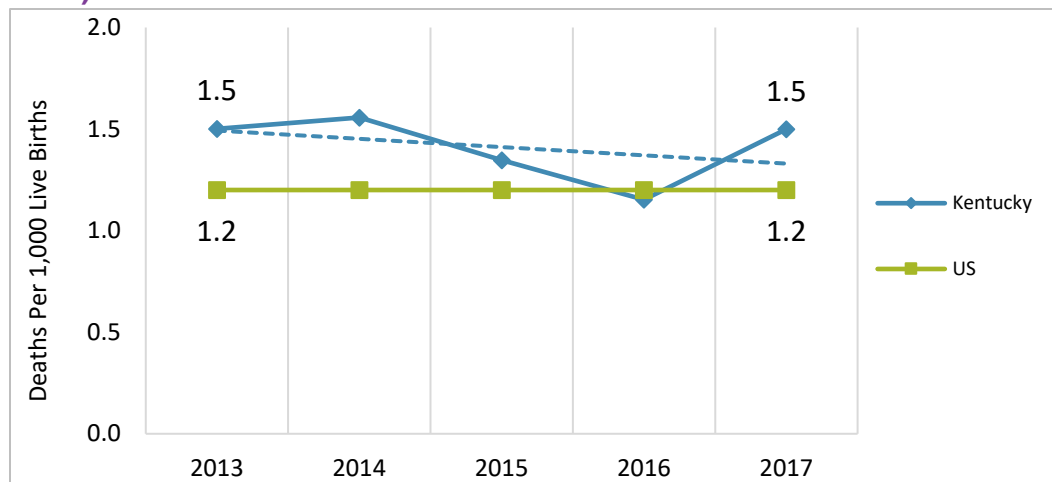
Birth Defect Associated Deaths

Birth defects are the third leading cause of infant mortality. Birth defects or congenital anomalies are health conditions that alter the structure of one or more body parts and occur during development in

pregnancy.¹¹ Some minor birth defects may not require intervention or may be corrected with surgery or therapy. Other defects are more serious causing lifelong physical and/or mental disabilities or are not compatible with life. Birth defects are a common cause of mortality among infants. Annually, 70-80 deaths among infants (~20%) are related to birth defects.

Infant deaths due to birth defects occurred at a rate of 1.2 deaths per 1,000 live births in 2016. Since 2012, the United States rate has remained relatively stable while the Kentucky rate has decreased (Figure 12). Before 2016, Kentucky's rate had been slightly greater than the US rate. The Child Fatality Review program will continue to monitor this trend.

Figure 12. Rate of Infant Deaths Due to Birth Defects Compared to the Nation (2013-2017)



Note: 2013-2017 data are preliminary and may change.

Data Source: Kentucky Vital Statistics, Birth Certificate Files 2013-2017 and Death Certificate Files 2013-2017. Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2017 on CDC WONDER online database, released December, 2018. Data are from the Multiple Cause of Death Files, 1999-2017, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/ucd-icd10.html> on Aug 5, 2019 2:06:21 PM.

The most common birth defects in Kentucky resulting in death are congenital heart defects and chromosomal abnormalities. The Kentucky Newborn Screening Program provides oversight and review of the critical congenital heart defect screenings. This program provides early identification, referral, and treatment to reduce the number of deaths in Kentucky. Approximately 53,000 infants are screened by local birthing hospitals annually. More than 1,000 infants per year are linked to pediatric cardiology for evaluation, diagnosis, and long-term follow-up.

Patterns in Kentucky Child Deaths (1-17 years of age)

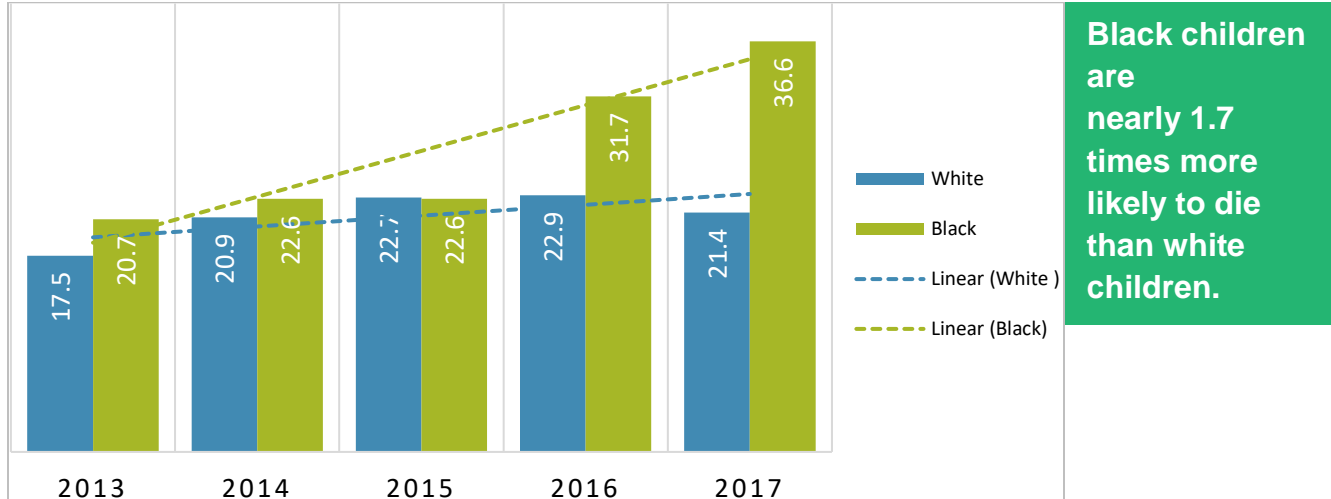
Child mortality, or child death, is the death of children 1-17 years of age. There were 231 deaths among Kentucky children 1-17 years of age (24.2 deaths per 100,000 children) in 2017. This rate is approximately 18% higher than the US rate (20.5 deaths per 100,000 children).

Racial Disparity among Child Deaths

Similar to infant deaths, there is a racial disparity among child deaths in Kentucky. Black children had a death rate of 36.6 deaths per 100,000 compared to 21.4 deaths per 100,000 for white children (Figure 13). A black child is approximately 1.7 times more likely to die than a white child. Kentucky's rates are

similar to the United States. In the US, the rate among black children is approximately 30 deaths per 100,000 compared to 19 deaths per 100,000 for white children.¹²

Figure 13. Mortality Rates per 100,000 Children (1-17 Years of Age) by Race and Year (2013-2017)



Note: 2013-2017 data are preliminary and may change. Only black and white child mortality rates are presented, regardless of ethnicity. All other races are excluded so rates presented do NOT equal Kentucky's overall Child Mortality Rate.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017; Kentucky State Data Center, Population Estimates by Race 2013-2017.

The five leading causes of death in 2017 among white and black children 1-17 years of age were:

White Children

- 1 •Motor vehicle collisions
- 2 •Suicide
- 3 •Homicide
- 4 •Drowning
- 5 •Birth defects

Black Children

- 1 •Homicide
- 2 •Motor vehicle collisions
- 3 •Nervous system disease
- 4 •Cancer
- 5 •Drowning

White children die at a greater rate due to suicide (2.5 per 100,000) compared to black children (1.8 per 100,000). Black children die at a disproportionate rate due to homicide (9.2 per 100,000) compared to white children (2.4 per 100,000). Drowning deaths occurred at a rate of 1.8 per 100,000 among black children and 1.2 per 100,000 among white children during 2017. A tailored approach is needed to address these specific racial disparities because of these differences.

Motor Vehicle Collision Deaths

In Kentucky, child deaths due to motor vehicle collisions (MVC) have declined by nearly 40% since 2005. Despite fewer deaths due to MVCs, they remain the leading cause of injury-related deaths among children 0-17 years of age in Kentucky and the United States.¹³ In the past 10 years, Kentucky has made steady progress in reducing the death rate from unintentional injuries for children 14 years of age and younger.

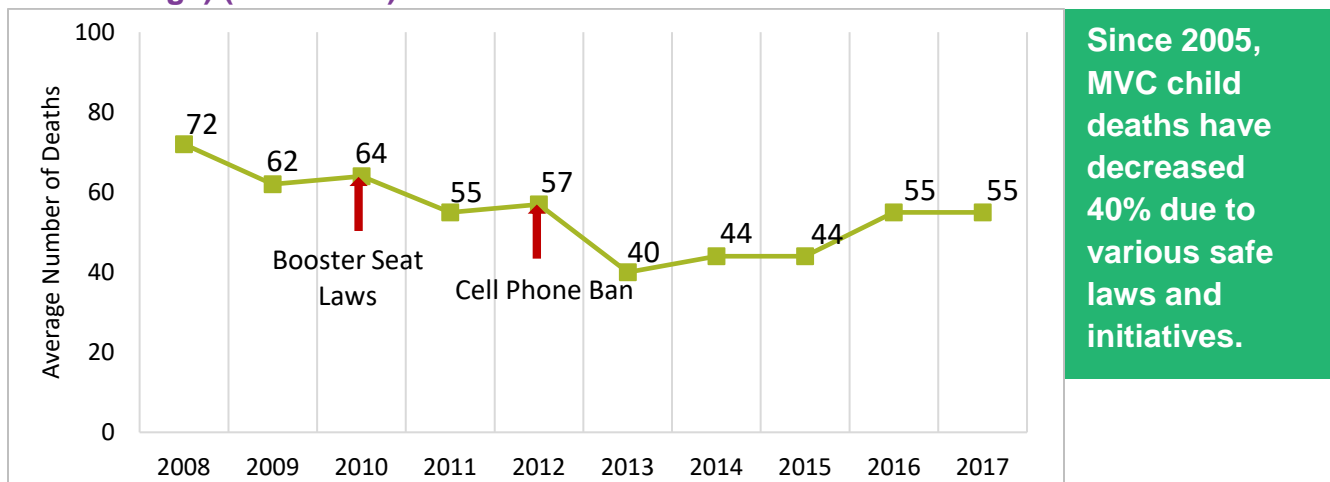
The 2015 Maternal and Child Health Title V Needs Assessment identified improper use or lack of car seats as an issue causing child injuries and deaths. Title V funds were given to local health departments for staff training to become a certified car seat installers and educators for caregivers. Staff provide community education regarding the correct age and size-appropriate child safety seat and passenger safety, including “Look Before You Lock” (<https://www.wheresbaby.org>).

In 2018, the Kentucky Office of Highway Safety identified:

- 18 national certification courses taught adding 171 new technicians:
 - 91 firefighters;
 - 59 police officers;
 - 12 hospital staff;
 - 9 local health department staff;
- 992 car seats checked; and
- 346 seats distributed across 40 counties.

Initiatives such as the graduated driving license law, booster seat law, and the cell phone ban for teen drivers are factors associated with the decrease (Figure 14). Some of the interventions occurred in years prior to those represented in this graph.

Figure 14. Trends in Number of Motor Vehicle Collision Deaths among Children (0-17 Years of Age) (2006-2017)



Note: 2013-2017 data are preliminary and may change. A three-year rolling average has been plotted to present the trend in Kentucky’s motor vehicle deaths from 2006-2017. Therefore, the data point at 2008 is really a yearly average of 2006, 2007, and 2008, and so on and so forth.

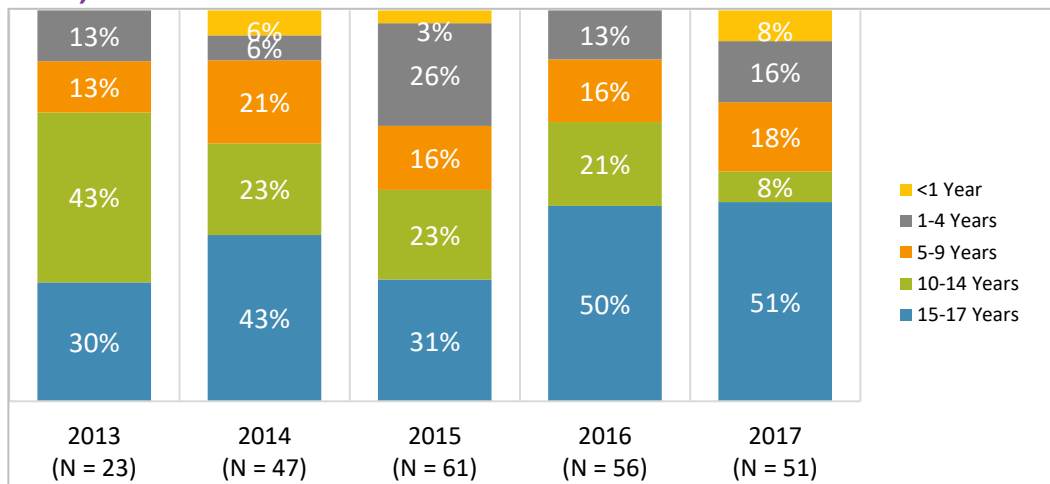
Data Source: Kentucky Vital Statistics, Death Certificate Files 2006-2017.

Teenage Motor Vehicle Collisions

Obtaining a driver's license is a rite of passage for teenagers. Many teenagers are learning to drive, have recently obtained a driver's license, are driving independently, or sharing rides with other teenage drivers. Developmentally, teenagers do not recognize their own vulnerabilities and limitations.

Motor vehicle collisions are the leading cause of death for teenagers in Kentucky and the US.¹⁴ The greatest number of deaths occur among teenagers 15-17 years of age (Figure 15).

Figure 15. Motor Vehicle Collision Deaths among Children by Age Group and Year (2013-2017)



Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths for each age group for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Maternal and Child Health programs address teenage driver deaths through collaborative efforts with the Kentucky Injury Prevention Research Center. Local health departments implement strategies through a pre-packaged teen driving child fatality review program.

In 2017, 79 fatal collisions occurred in Kentucky involving teen drivers. Teenage drivers were involved in 262,109 collisions (8%).¹⁵ Efforts to reduce teenage driver deaths include the graduated driver's license initiative. The initiative prohibits cell phone use for drivers under 18 years of age and develops driver safety programs to address risk factors for teenage drivers.

Many local health departments completed child passenger safety plans including car seat checks, Checkpoints™ Program, and the graduated licensure program. Local health departments have been innovative in

Leading Causes of Teen Crashes¹⁴

1. Driver inexperience
2. Driving with teen passengers
3. Nighttime driving
4. Not using seat belts
5. Distracted, drowsy, reckless, impaired driving

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creating distracted driver videos, working with local high schools and other community and emergency services to provide education.

The Kentucky Violence and Injury Prevention Program is supported by CDC Cooperative Agreement U17 CE924846. The program collaborates with the Kentucky Office of Highway Safety, Kentucky Association of Counties, Kentucky Injury Prevention Research Center, Kentucky Safety Prevention Alignment Network, and Kentucky Department for Public Health to address teenage motor vehicle safety education. The Checkpoints™ Program is an evidence-based, parent-oriented teen driving intervention developed by the National Institute of Child Health and Human Development, an agency of the US Department of Health and Human Services. The program is being piloted in Kentucky and has been revised to reflect Kentucky's graduated driver's license program requirements and to include Kentucky injury data.

The Checkpoints™ Program provides parents and teenagers with information about:

- Risks teenagers face when first licensed (e.g., facts and myths about teen driving safety);
- Graduated driver's license requirements;
- How to improve the safety of teen drivers;
- How to communicate effectively with teens about safe driving; and
- How to set driving agreements that are customizable to the parents and teenagers, establishing clear guidelines, expectations, and consequences for their teenager's driving.

Checkpoints™ implementation was successful in 20 high schools in 14 counties in 2018. Participants were:

Graves County Health Department	2 high schools
Green River Area Development District	1 high school in Daviess County
Lincoln Trail District Health Department	8 high schools in Hardin, Meade, Larue, Marion, Washington, and Nelson counties
Jessamine County Health Department	2 high schools
Madison County Health Department	2 high schools
Mason County Health Department	1 high school
Pennyrile District Health Department	2 high schools in Livingston and Caldwell counties
Woodford County Health Department	2 high schools

Checkpoints™ will continue in 2019 with a goal of 35 high schools in 20 counties.

The Kentucky Violence and Injury Prevention Program provides training and curriculum to law enforcement about the traffic safety Checkpoints™ program. The training component relevant to adolescent health is educating law enforcement officers on the identification of impaired driving, human trafficking, improper restraint use, and other violations.

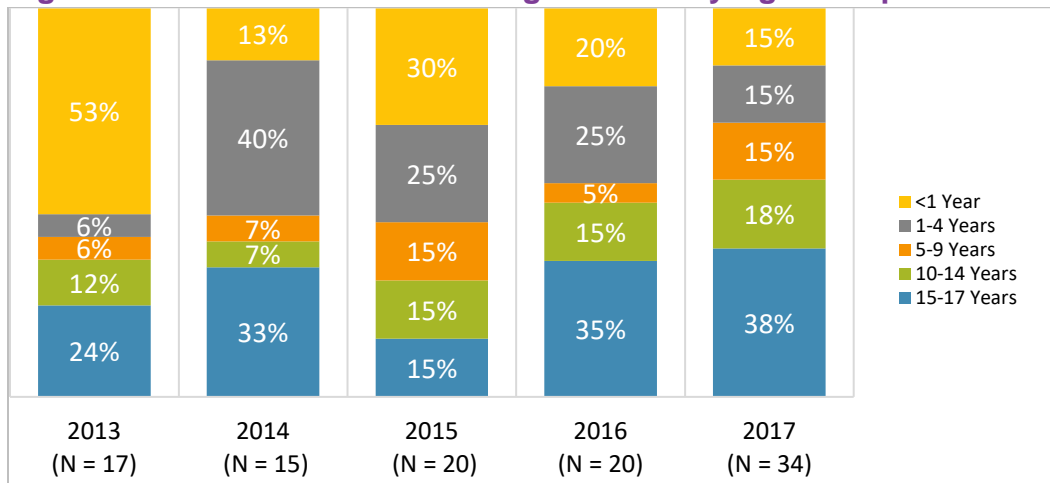
Homicide Deaths

Youth violence is a major public health concern. It increases the risk for behavioral and mental health difficulties, additional violence, smoking, substance abuse, obesity, high-risk sexual behavior, depression, academic difficulties, and suicide.¹⁸ Children are either witnesses, victims, or perpetrators of violence.¹⁷ Violent crimes include child abuse and neglect, rape, homicide, and other forms of assault. Youth violence may have lifelong effects on physical, psychological, and social functioning.¹⁷

Prevention of youth violence, child maltreatment, and homicide is a high priority for Kentucky. Some effective strategies include school-based programs, family approaches that address coping skills, nurturing families, and creation of protective community environments.¹⁸

Violent death or homicide is a major concern for Kentucky's children as homicides have doubled since 2013 (Figure 16). On average, each year approximately 50% of these violent deaths occur among Kentucky children under the age of five. However, in 2017, only 30% of childhood homicides were among children less than five (Figure 16).

Figure 16. Homicide Deaths among Children by Age Group and Year (2013-2017)



Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths for each age group for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

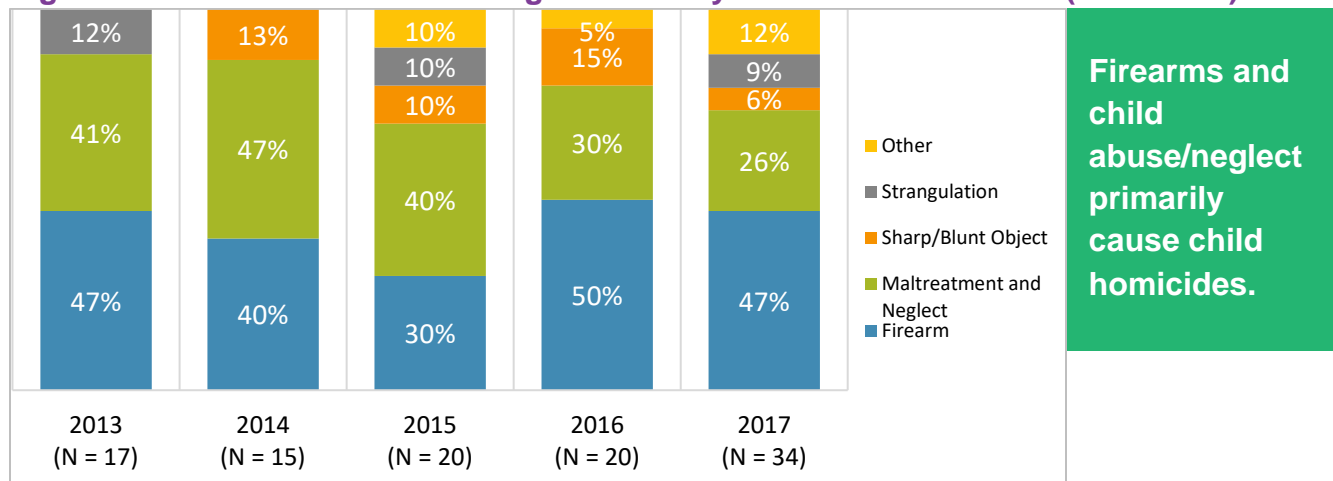
Homicide/violence prevention initiatives differ greatly based on the age group in which these homicides occur. The number of deaths due to child maltreatment is likely greater than reported because it is often not entered as the cause of death on a death certificate.¹⁹ In Kentucky, approximately 30-40% of child homicides are due to maltreatment and neglect (Figure 18). Young children are the most vulnerable for fatal child abuse or neglect. Children under four years of age account for 81.6% of all maltreatment deaths in the US, and over half of these occur among infants.¹⁹ In 2017, all of the child maltreatment and neglect deaths documented in the Kentucky vital statistics data occurred among children under the age of five (Figure 17). One or both parents/partners commit the majority (80.1%) of maltreatment deaths.²¹ Said homicides are interrelated due to poverty, domestic violence, and substance abuse.²¹

1 out of 3 Kentucky child homicides are due to maltreatment & neglect

The major risk factors for child abuse and neglect are listed below.¹⁹

- Young children (<4 years old)
- Non-biologic caregivers in home
- Intimate partner violence
- Substance abuse/mental health issues
- Parents' history of child abuse
- Children with special needs
- Parent's young age
- Low education and income
- Single parenting

Figure 17. Homicide Deaths among Children by Mechanism and Year (2013-2017)



Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths for each mechanism category for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning. Other category includes homicides in which the mechanism was unspecified, poisonings, vehicular, and fire.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Pediatric abusive head trauma occurs when a child is violently shaken, slammed, or struck. This a serious type of physical abuse that can be fatal. Pediatric abusive head trauma occurs most frequently in infants such as a caretaker losing patience when a child will not stop crying, bedwetting, fussy eating, and disobedient behavior.²²

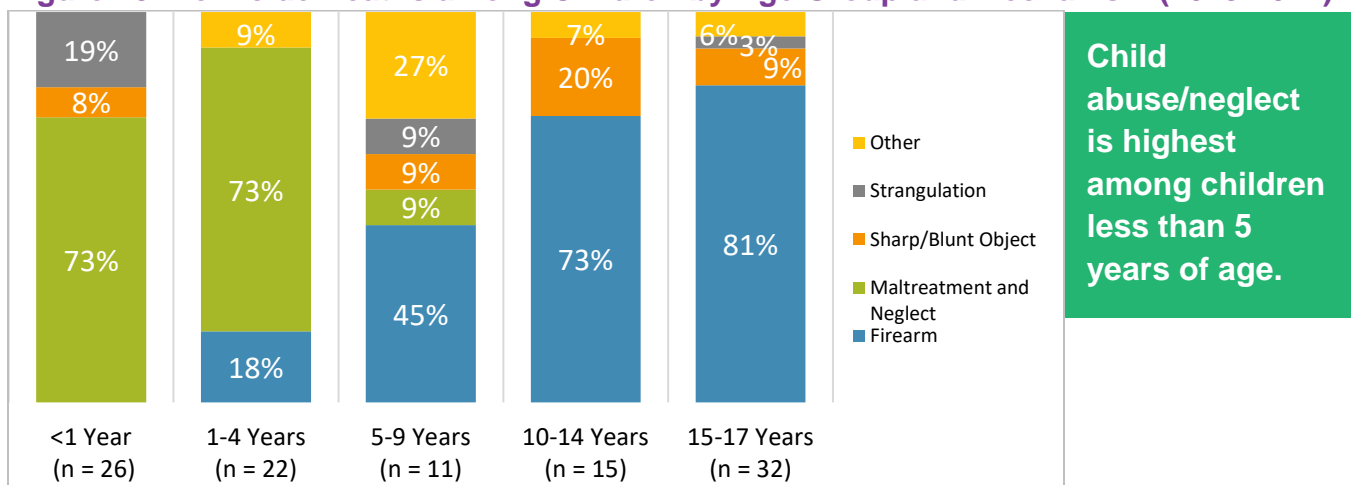
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Kentucky strives to reduce circumstances of pediatric abusive head trauma. However, surveillance of pediatric abusive head trauma and other child abuse-related fatalities is difficult. Identifying pediatric abusive head trauma is limited with review of hospital billing data. Providers are not primary investigators and do not use billing codes specific to child abuse or pediatric abusive head trauma. Most billing codes identify only the specific injury for the infant or child.

Comparing claims data with medical record review was a 2019 goal. Workforce capacity was limited and Maternal and Child Health Division was not able to establish this practice. Maternal and Child Health Division remains deeply committed to continue education and promotion to reduce pediatric abusive head trauma. Maternal and Child Health Division will continue developing materials for specific groups of providers with Kentucky Safety Prevention Alignment Network, the Division of Pediatric Forensic Medicine, Prevent Child Abuse Kentucky, Kentucky Chapter of the American Academy of Pediatrics, and local health departments.

Preventing child abuse and neglect requires a comprehensive public health approach focused on improving the health and well-being of individuals before child abuse and neglect occurs.²³ Public health approaches influence social environment, community involvement, relationships among families and neighbors, and individual behaviors. Modifying policies, practices, and social norms to create safe, stable, nurturing environments are necessary for effective prevention strategies.²³

Figure 18. Homicide Deaths among Children by Age Group and Mechanism (2013-2017)



Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. Data based on 20 or fewer deaths are not statistically valid for intervention planning. Other category includes homicides in which the mechanism was unspecified, poisonings, fire, and vehicular.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

High school curricula were developed with many community organizations to educate students about pediatric abusive head trauma and safe sleep environments. This curricula enhances Kentucky Regular Session 2010, House Bill 285 encouraging prevention of pediatric abusive head trauma with Kentucky high schools. Curricula are lectures and interactive materials with pre-tests to determine knowledge and post-tests to determine retention. The cost for this joint collaboration was minimal. Title V Maternal and Child Health funds were used for training supplies and education materials for high schools.

The program was piloted in two high schools in northern Kentucky and with 110 students at the Health Occupations Students of America meeting. Preliminary results show 74% of students improved their

overall pediatric abusive head trauma/safe sleep knowledge. Pre-test scores improved by an average of 12% compared to post-test scores. Other notable findings from pre and post-test comparisons found:

- 85% increase in child abuse prevention knowledge (e.g., recognize child abuse, understand state reporting practices, and recognize normal bruising patterns);
- 19% increase in awareness of risk factors for pediatric abusive head trauma;
- 16% increase in how to select a safe caregiver;
- 10% increase in how to solve problems non-violently and manage stress (e.g., soothe a crying baby);
- 6% increase identifying pediatric abusive head trauma and its associated injuries; and
- 5% increase in how to promote safe sleep practices for infants (e.g., identify and mitigate risk factors for unsafe sleep).

Suicide Deaths

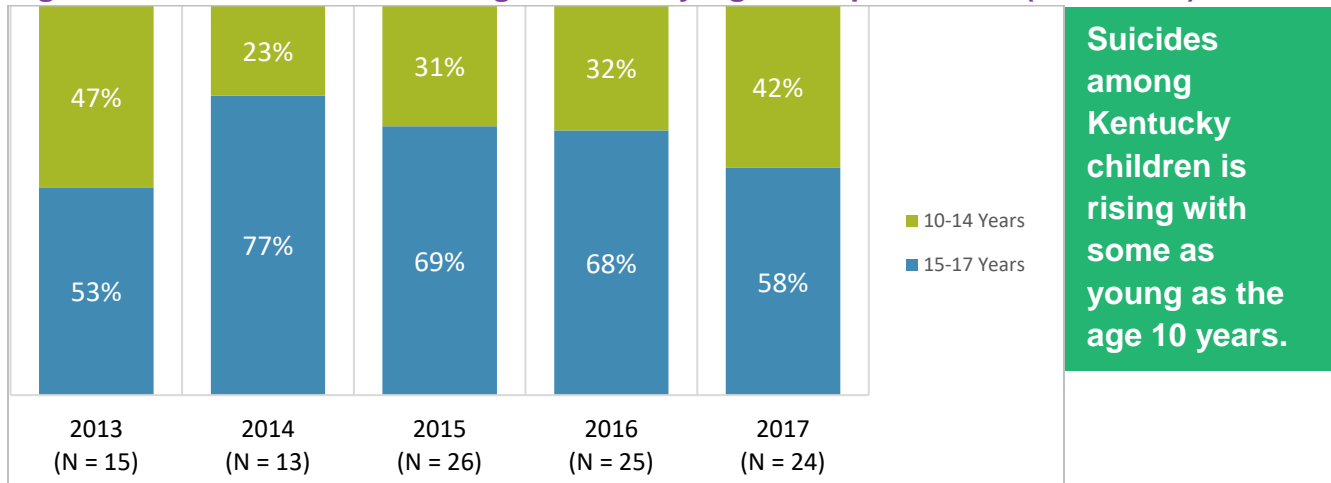
Suicide is the second leading cause of death among children 10-24 years of age in Kentucky and the United States.²⁴ Prevention efforts focus on the detection of warning signs. School staff throughout the state receive regular training to recognize the signs. With rates increasing and children as young as the age of 10 committing suicide, the need to increase awareness at all levels is required. Recognition of adverse childhood experiences along with improving resilience is essential.

An adverse childhood experience describes a traumatic experience in a person's life. These may be related to physical or sexual abuse, emotional abuse, mental illness of a parent/family member, substance use in the home, divorce of the parents, domestic violence, or incarceration of a family member. Protective factors help children positively reduce the negative impact of an adverse experience and build resilience to overcome the experience. Children are not automatically resilient or invulnerable to adverse experiences. Protective factors that support resilience are positive interactions with family, friends, or community. They also include safe, stable, and nurturing relationships with various individuals with whom the child may interact. Developing a sense of identity, purpose, or inclusion helps the child with social emotional health to mitigate the negative harm.

The reasons and methods used for committing suicide may differ between young children (10-14 years) and teens (15-17 years). Suicide attempts among younger children are often impulsive and associated with feelings of sadness, confusion, anger, or problems with attention and hyperactivity.²⁵ Suicide attempts among older teenagers may be associated with feelings of stress, self-doubt, pressure to succeed, financial uncertainty, disappointment, and loss. Thoughts about suicide are often associated with a mental health disorder. Depression is most often associated.²⁵

Childhood suicides nearly doubled from 2014 to 2015 and remained high in 2017 (24 suicides) (Figure 19). Youth suicide occurs most often among teenagers 15-17 years of age but rates have been increasing among youth 10-14 years of age.

Figure 19. Suicide Deaths among Children by Age Group and Year (2013-2017)

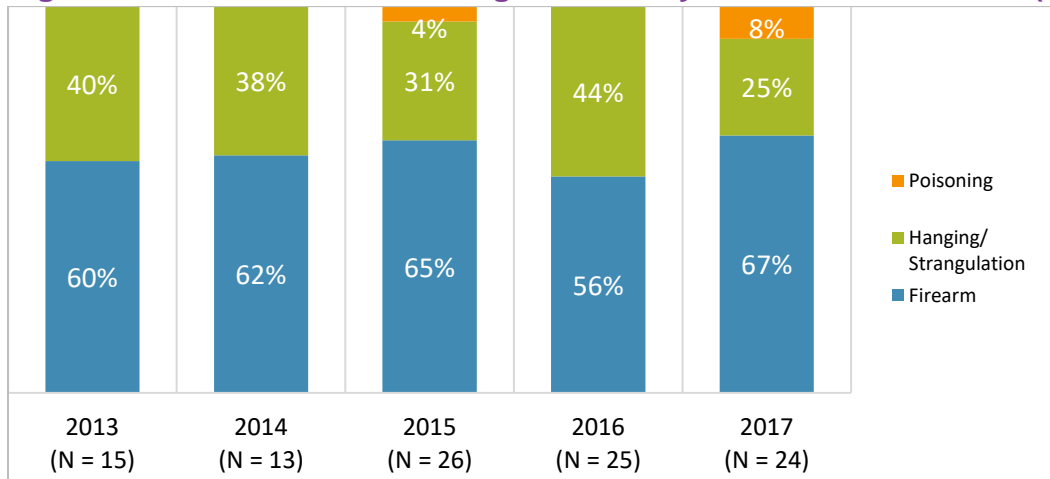


Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths for each age group for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Firearms and hanging/strangulation are the main methods used in youth suicides. Firearms are associated with over half of Kentucky's childhood suicides (Figure 20). While suicide by firearm is more prevalent among children 10-14 years of age, suicide by firearm and hanging/strangulation occur at similar rates in children 15-17 years of age (Figure 21).

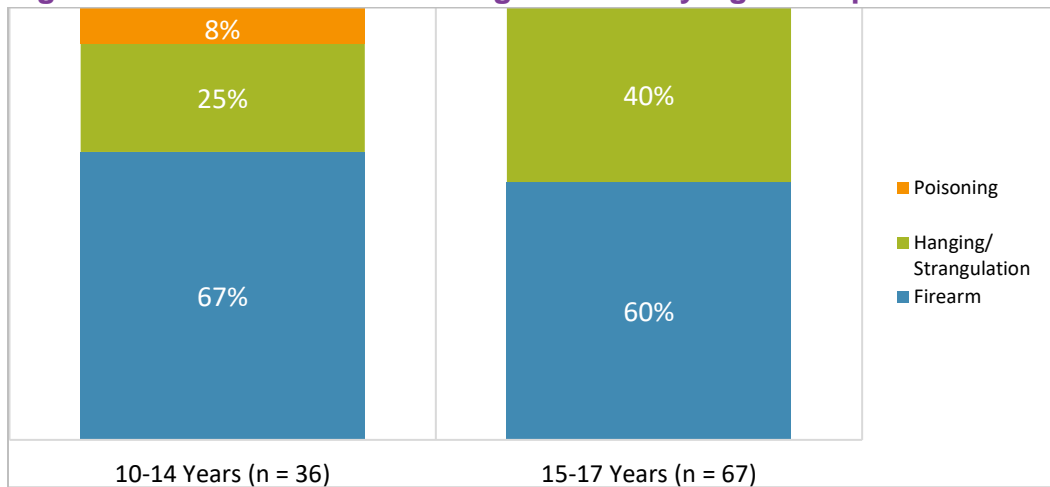
Figure 20. Suicide Deaths among Children by Mechanism and Year (2013-2017)



Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths by mechanism for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Figure 21. Suicide Deaths among Children by Age Group and Mechanism (2013-2017)



Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. Data based on 20 or fewer deaths are not statistically valid for intervention planning.

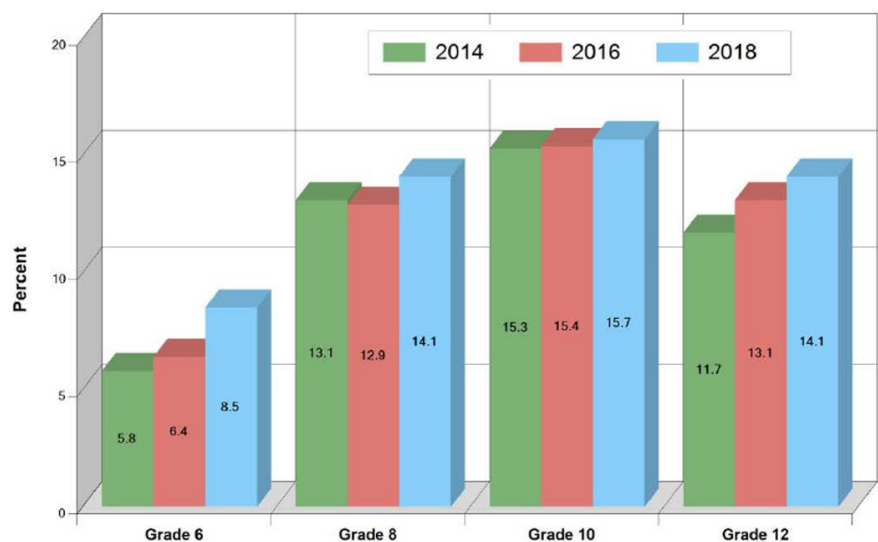
Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Suicidal ideation and reported suicide attempts have increased since 2009 in every grade. There was a significant increase among 6th grade respondents reporting they have seriously considered attempting suicide. Students in the 12th grade also saw an increase in suicidal ideation. This warrants immediate prevention activities with families and schools.³³

Question 22 - During the past 12 months, did you ever seriously consider attempting suicide?

Grade	2014	2016	2018
6	5.8%	6.4%	8.5%
8	13.1%	12.9%	14.1%
10	15.3%	15.4%	15.7%
12	11.7%	13.1%	14.1%

REACH Evaluation released the 2018 Kentucky Incentives for Prevention report on students in grades 6, 8, 10, and 12. The report bi-annually surveys alcohol, tobacco, and drug use along with handguns, bullying, dating violence, suicide, and mental health. (KIP Survey, REACH Evaluation <https://reacheval.com/projects/kentucky-incentives-for-prevention-kip-survey/>).



Kentucky youth report bullying and cyberbullying has slightly declined while US averages remain high <https://www.kipsurvey.com/>. In 2014, the Kentucky Youth Bullying Prevention Task Force was established to address bullying in schools. Education was reinforced in the school system to reduce bullying and build recognition of children who may be at risk. In the past year, Maternal and Child Health Division collaborated with the Department of Behavioral Health, Developmental and Intellectual Disabilities in efforts using the Sources of Strength curriculum. Sources of Strength is an integrated program of outreach and prevention curriculum supported at the local level. Training programs have been conducted with local school districts to promote peer-led youth resiliency programs.

The Kentucky Violence and Injury Prevention Program staff produced “Self Harm Related Emergency Department Visits and Hospitalizations among Kentucky Adolescents 10-19 Years old, September 1, 2015-August 31, 2018” and presented the report to the suicide prevention team at the Department for Public Health.

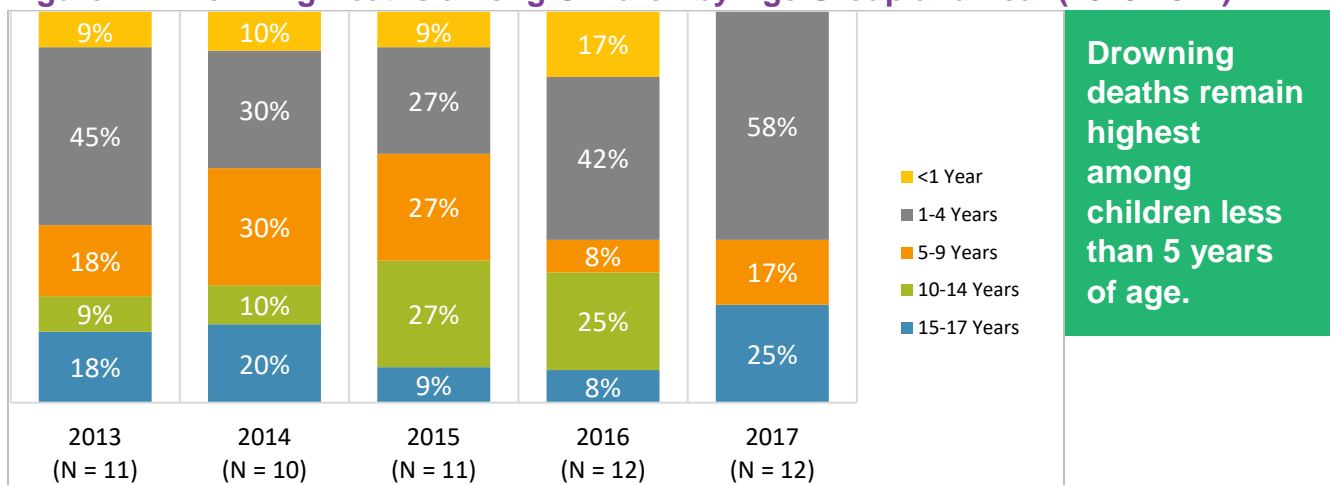
Nineteen local health departments partnered with schools and Maternal and Child Health Division in selecting the Bullying and Suicide Prevention MCH Package. The package reinforces and links school districts with resources for prevention through regional treatment centers or grief counseling. In 2018, this package reached nearly 20,000 students and community members and provided training of Sources of Strength with 50 school staff members. Many schools elected to have anti-bullying messaging on bulletin boards with periodic changes throughout the year to educate parents, staff, and students about bullying or suicide.

WEDCO District Health Department continued a Beautiful Minds Project in collaboration with University of Kentucky. The project provides onsite mental health screenings and counseling, when possible. Over 400 students and staff self-referred for mental health screening and additional linking to medical and mental health homes.

Drowning Deaths

Estimates indicate two children less than 14 years of age unintentionally drown per day in the US.²⁶ In Kentucky, 12 children unintentionally drown per year with the majority 1-4 years of age (Figure 22).

Figure 22. Drowning Deaths among Children by Age Group and Year (2013-2017)



Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths for each age group for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning.

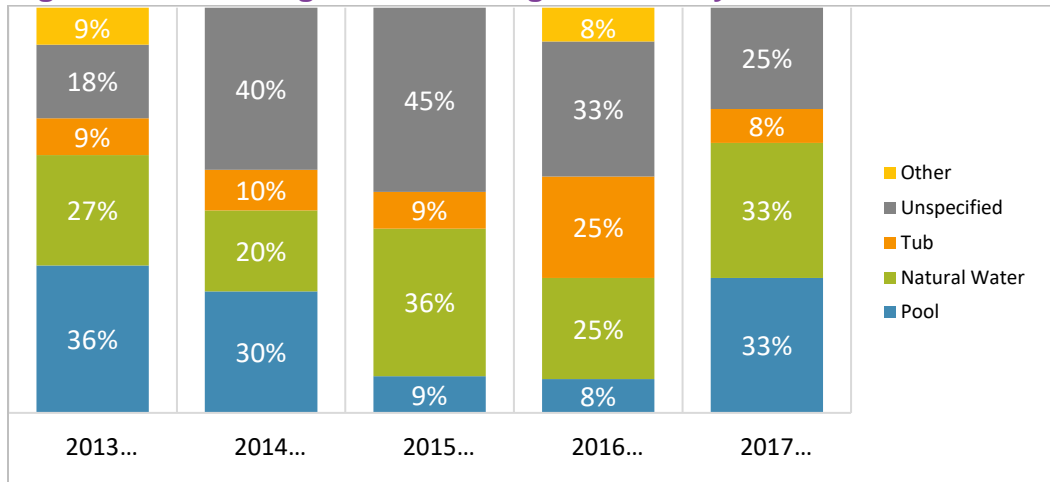
Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Prevention of unintentional drowning requires an understanding of the water source in which drownings occur. Water sources are natural bodies of water such as lakes or rivers, pools (swimming), or tubs of water. “Other” is used as a source when a child drowns in a bucket of water or by another less common water source. By defining the water source, targeted prevention activities can be developed and

distributed to at risk populations. The water source or location of a drowning may not be specified on the death certificate. As a result, a large number of drownings are classified as “Unspecified.” Data should be interpreted with caution.

Drownings in a pool have decreased over time, with the exception of 2017 (Figure 23). Children 1-4 years of age commonly drown in pools.²⁶ Water source associated with drownings differ based on age of the child. Tub drownings are highest among infants (0-1 year of age) while pool drownings are highest among children (1-4 years of age). Natural water source drownings increase with age (Figure 24). As expected, the majority of drowning deaths in Kentucky occur during the summer months (May, June, July, and August).

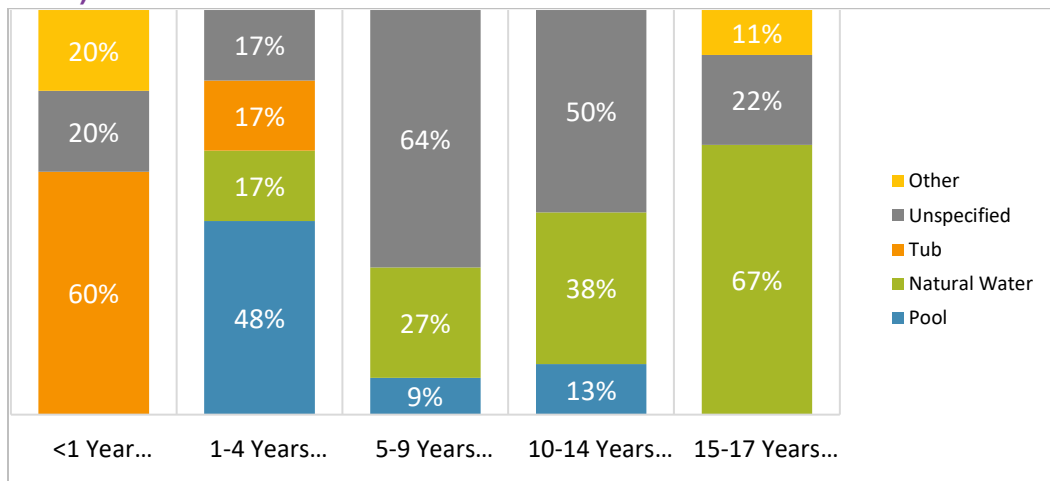
Figure 23. Drowning Deaths among Children by Water Source and Year (2013-2017)



Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths by water source for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning. Other category includes drownings that occurred in a bucket and undetermined intent.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Figure 24. Drowning Deaths among Children by Age Group and Water Source (2013-2017)



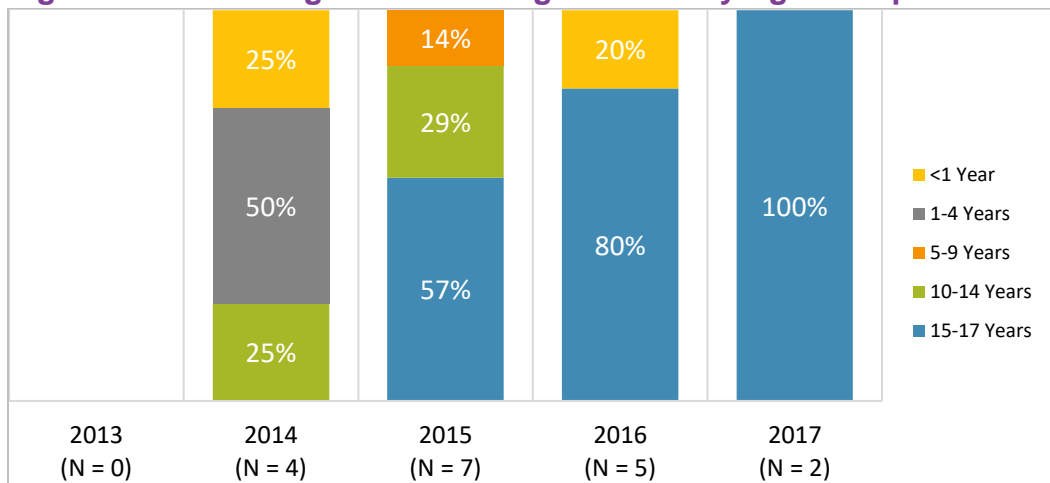
Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning. Other category includes drownings in which the mechanism was a bucket or undetermined intent.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Poisoning Deaths

Poisonings include any substance which is inhaled, injected, eaten, or absorbed through the skin in quantities exceeding recommended dosages.²⁷ In addition to chemicals marked with poison warning labels, common household items such as household cleaners, laundry detergent, and medicine can be poisonous to children.²⁸ According to the Centers for Disease Control and Prevention, more than 300 children from birth to 19 years of age are treated in an emergency department every day across the US. Nationally, two children die from poisoning every day.²⁸ In Kentucky, two child deaths occurred due to poisoning in 2017 (Figure 25). Since the occurrences are very low, data should be interpreted with caution.

Figure 25. Poisoning Deaths among Children by Age Group and Year (2013-2017)



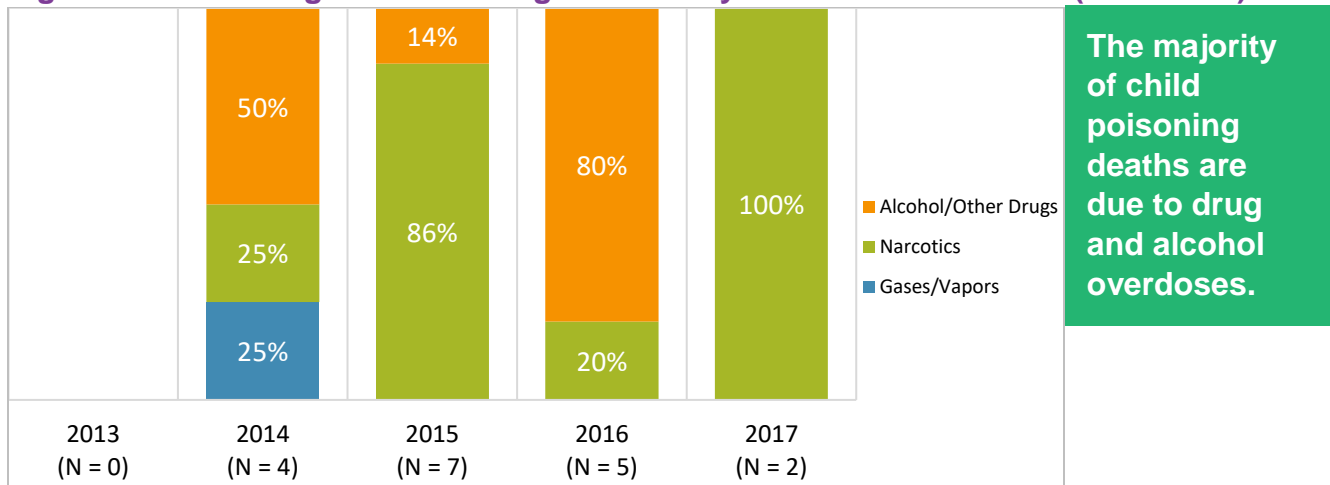
Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths by age group for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Overdoses in young children occur when drugs, alcohol, or other harmful substances are accidentally ingested. Comparatively, overdoses in teenagers typically occur when drugs, alcohol, or other harmful substances are intentionally ingested. Prevention strategies will differ greatly depending on the age of the child.

Unintentional poisonings are not isolated to young children. Children 15-17 years of age represent the greatest number of all unintentional childhood poisoning deaths in Kentucky. Nationally, the same trend is found in the 15-17 years of age group.²⁹ Most poisoning deaths among the 15-17 years of age group is due to substance use and/or alcohol overdoses.

Figure 26. Poisoning Deaths among Children by Mechanism and Year (2013-2017)



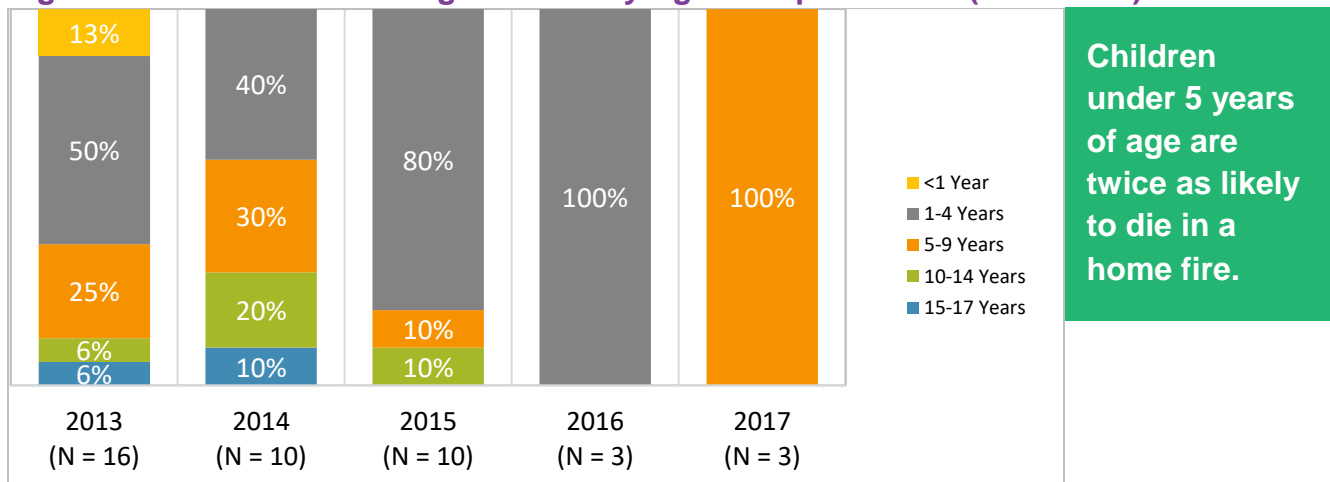
Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths by mechanism for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning. Other drugs include cough medicine, antidepressants, methamphetamine, and unspecified substances.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

Fire Deaths

Fire deaths are preventable, but remain a major cause of death and injuries in Kentucky. Early warning from a smoke alarm and established fire escape plans can save lives. Home fires can spread quickly and leave families with only two minutes to escape.³² Smoke alarms should be on every level of a home and be tested monthly. Practicing a fire escape plan with family members twice a year may prevent fire deaths. Young children are most at risk in home fires due to their dependence on adults. Nationally, children 5 years of age or younger are twice as likely to die in a home fire.³¹ In Kentucky, over half of child fire deaths occur in children under the age of five (Figure 27). There were three fire deaths among Kentucky children in 2016 and again in 2017.

Figure 27. Fire Deaths among Children by Age Group and Year (2013-2017)



Note: 2013-2017 data are preliminary and may change. Due to rounding, numbers may not equal 100%. There was no statistically significant difference in the percentage of deaths by age group for 2017 compared to previous years. Data based on 20 or fewer deaths are **not** statistically valid for intervention planning.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2013-2017.

CHILD FATALITY PREVENTION MEASURES

Promotion of Safe Sleep

In 2016, the American Academy of Pediatrics broadened guidelines for the Safe to Sleep program. Recommendations include:

Placing infant on their back in their own bed on a firm sleep surface.	Consider giving the infant a clean, dry pacifier when placing down to sleep.
No pillows, comforters, or other soft surfaces.	Set the room temperature to ensure infant does not become too hot.
Keep infant crib free of soft objects, toys, and loose bedding.	Infant should be appropriately dressed – no more than one clothing layer more than the caregiver.
No smoking around the infant.	Avoid products that claim to reduce the risk of SIDS. Most have not been tested for safety.
Infant should be alone in their own bed.	

Safe to Sleep materials are available at no cost from the National Institute of Child Health and Human Development at <http://www.nichd.nih.gov/sts>. An image of a popular poster is attached at the end of this report.

The Maternal and Child Health Division has developed evidence-informed strategies and used grant funding with local health departments for targeted prevention efforts. These aid in the promotion, education, and prevention of sleep-related death.

Safe Sleep for Child Care Providers	provides education, training, and safe sleep materials for child care staff and families.
Safe to Sleep Community Partners	provides education and training to local organizations to promote safe sleep practices throughout the community.
Cribs for Kids for Community Partners	distributes Cribs for Kids kits to community partners for families needing a safe sleep environment for their infant.



ALONE

Alone in their crib

Share the room, not the bed. The safest place for your baby to sleep is in your room, but NOT in your bed.



BACK

On Your Back for Nights and Naps

A baby should always sleep on their back at night and during nap time. Back sleeping on a firm mattress in a crib or play yard decreases the risk for SIDS.



CRIB

Clean, Clear Crib

A baby's crib should contain a fitted sheet only; no blankets, toys, pillows, bumpers, or other items that could cover a baby's face and suffocate them. Cribs, bassinets and play yards with firm mattresses are the only safe places for babies to sleep.



DANGER

Be Aware, Not Impaired

Drinking and drug use impair your ability to care for a baby, making bed-sharing and other unsafe sleep even more dangerous for the baby.

Visit www.SAFESLEEPKY.com or connect on



Resources and Initiatives



Kentucky uses the data from the Safe Sleep campaign, SUID Case Registry, Safe Sleep website and Facebook page to inform data-driven policy development and best practices. The registry has four goals to:

1. Identify all Kentucky resident unexpected infant deaths;
2. Review all identified cases;
3. Collect consistent data on each case; and
4. Utilize data to develop prevention strategies.

The information obtained from the registry is shared with Child Fatality Review coordinators, physicians, and other stakeholders to inform decision making and prevention activities. The figures and tables in this report are created from SUID registry data sets.

Prematurity Prevention



The Maternal and Child Health Division promotes an evidenced-informed package using education from Healthy Babies are Worth the Wait to reduce early elective deliveries to reduce preventable preterm births. Local health departments provided education and encouraged policy change in community hospitals and prenatal care providers. In 2017, seven local health departments chose to reduce premature deliveries by raising awareness and reaching nearly 2,000 women. The reach continued to grow in 2018 with approximately 8,500 women receiving education on the importance of preventing early elective deliveries and preterm birth.



The Maternal and Child Health Division promotes the March of Dimes Prematurity Prevention Initiatives to:

- Maintain a healthy weight before pregnancy.
- Gain the proper amount of weight during pregnancy.
- Do not smoke; drink alcohol; use drugs; or abuse prescription drugs.
- Get a prenatal care checkup as soon as you think you are pregnant.
- Seek treatment options for chronic health conditions.
- Reduce stress.
- Protect yourself from infections.
- Wait at least 18 months between pregnancies or births.

Prematurity Prevention Initiatives



The Perinatal Quality Collaboratives focuses on the impact of substance use for maternal and infant health. The Kentucky Perinatal Quality Collaborative was suspended due to lack of funding in 2017. However, in 2019, a new endeavor to re-establish this important activity has begun.

This collaborative will provide valuable surveillance of Kentucky birthing facilities to determine current quality improvement activities have been initiated in these hospitals. The group that is chartered for the Kentucky Perinatal Quality Collaborative will develop a strategic plan to address the highest priorities impacting infant mortality such as exposure to substance in utero, premature birth, etc.



The Pregnancy Risk Assessment Monitoring System allows Kentucky to collect data on maternal attitudes and experiences before, during, and shortly after pregnancy. Data points are used to identify high-risk groups of women and infants in addition to measuring the health progression of mothers and babies. One significant use of this data is to understand how safe sleep practices have been taught to the expecting mother or pediatric visits as well as the parents engagement with safe sleep practices. In 2017, of those surveyed, 98% reported a medical provider engaged and discussed safe sleep practices. However, those who reported having a safe sleep

environment was much lower.

Birth Defect Prevention

Women can increase their chance of having a healthy baby by managing health conditions and committing to healthy behaviors before becoming pregnant. The Centers for Disease Control and Prevention is encouraging women to “Make a PACT” to get healthy before and during pregnancy by actively trying to Plan ahead, Avoid harmful substances, Choose a healthy lifestyle, and Talk with a healthcare provider.

Birth Defect Initiatives



The Kentucky Birth Surveillance Registry has been dedicated to preventing birth defects through surveillance, referral of infants to services, and promotion of birth defect programs. Data from the registry is designed to provide information on incidence, prevalence, trends, and possible causes of stillbirth, birth defects, and disabling conditions.



The Kentucky Folic Acid and Perinatal Partnership (KFAP) provides leadership and action for the statewide folic acid campaign to prevent neural tube defects, address causes for premature birth, promote safe sleep campaigns, and address the impact that substance use during pregnancy has on infant and mother health outcomes.



The Kentucky Perinatal Association is a volunteer association of healthcare providers and organizations focusing on recognition of high-risk maternal and infant healthcare issues. They collaborate closely with the Maternal and Child Health Division to promote activities, education, needs assessment, and training for community stakeholders, obstetricians and gynecologists, nurses, hospitals, and others. This collaboration has provided a broad interaction at the community level to promote public health prevention activities at regional meetings strategically held in areas of Kentucky at high risk, and with an annual Maternal and Child Health Conference.

Motor Vehicle Collision Prevention

The Centers for Disease Control and Prevention provide the following recommendations for proper child safety and booster seat use. Kentucky Revised Statute 189.125 requires booster seats for children under 8 years of age and between 40 and 57 inches tall. At 9 years of age or older, decisions should be made on an individual basis about seatbelt fit and booster use.



<https://www.cdc.gov/features/passengersafety/index.html>.

Child safety seats, booster seats, and seat belts can reduce the risk of serious injury and death by as much as 80%.¹⁶

Motor vehicle collisions are the leading cause of death for teenagers in Kentucky.¹⁷ Local health departments utilize Title V maternal and child health funds to provide education on seat belt use, passenger safety, and the dangers of distracted driving. Evidence-informed strategies encourage parent and teen safety contracts and the Graduated Driver Licensing program.

Graduated Driver Licensing (GDL) systems allow teen drivers to gain experience in low-risk driving conditions to acquire skills, maturity, and experience.

GDL Stages	Comprehensive GDL Program
<p>Stage 1 – learner's permit in which the teen driver can only drive under adult driver supervision.</p> <p>Stage 2 – intermediate or provisional license that allows teens to drive without</p>	<ul style="list-style-type: none"> • Minimum age of 16 years of age for a learner's permit. • Mandatory holding period of at least 12 months for a learner's permit • Nighttime driving restrictions between 10:00pm and 5:00am for provisional license holders.

supervision under low risk driving conditions.

Stage 3 – unrestricted license where teens can drive independently without restrictions.

- A limit of zero or one young passenger who can ride with a provisional license holder without adult supervision.
- A minimum age of 18 years of age for unrestricted licensure.¹⁸

Motor Vehicle Injury and Death Initiatives



The Kentucky Injury Prevention and Research Center works to decrease the burden of injury in Kentucky. The center integrates Kentucky's traffic record data systems to support traffic safety surveillance and research to prevent motor vehicle collisions. The Kentucky Injury Prevention and Research Center supports The Checkpoints™ program and a high school pediatric abusive head trauma program.



Kentucky's Office of Highway Safety works to "support effective and collaborative partnerships to advance traffic safety awareness, education, and enforcement in an effort to save lives on Kentucky roadways." The office partners with local health departments to train, coordinate, and promote proper installation of child safety seats.



The Kentucky Department for Public Health provides support and other resources to assist in achieving our common goal: keeping kids safe. Safe Kids Kentucky implements evidence-based programs to help parents and caregivers prevent childhood injuries. These activities include promotion of educational materials at local and state fairs on safety activities to promote pedestrian safety, child passenger safety, water play/sports safety, and bicycle safety.

Suicide Prevention Initiatives



The Department of Public Health and the Department for Behavioral Health, Development, and Intellectual Disabilities collaborated to create the Suicide Prevention Program. The program ensures the dissemination of suicide prevention training and resources for parents, caregivers, and educators.

The National Suicide Prevention Lifeline has additional resources available on their website: <https://suicidepreventionlifeline.org/>.



The Kentucky Department of Education participates in the Safe Schools program that includes suicide prevention and awareness. The department is currently providing Youth Mental Health First Aid Training for students.

Additional services and resources provided can be found on their website: <https://education.ky.gov/school/sdfs/Pages/Suicide-Prevention-and-Awareness.aspx>.

Do You Know the Warning Signs of Suicide?

The following behaviors may mean someone is at risk for suicide:

- Talking about wanting to die or kill themselves
- Looking for a way to kill themselves (searching for a gun or buying a gun)
- Talking about hopelessness or having no reason to live
- Talking about feeling trapped or in pain
- Talking about being a burden to others
- Increasing the use of alcohol or drugs
- Acting anxious or agitated
- Behaving recklessly
- Sleeping too little or too much
- Withdrawing or isolating themselves
- Showing rage or talking about seeking revenge
- Displaying extreme mood swings

National Suicide Prevention Lifeline or www.suicidepreventionlifeline.org

Homicide Prevention

Preventing Child Abuse and Neglect	
Strategy	Approach
Strengthen economic supports to families	<ul style="list-style-type: none"> • Strengthening household financial security • Family-friendly work policies
Change social norms to support parents and positive parenting	<ul style="list-style-type: none"> • Public engagement and education campaigns • Legislative approaches to reduce corporal punishment
Provide quality care and education early in life	<ul style="list-style-type: none"> • Preschool enrichment with family engagement • Improved quality of child care through licensing and accreditation
Enhance parenting skills to promote healthy child development	<ul style="list-style-type: none"> • Early childhood home visitation • Parenting skill and family relationship approaches
Intervene to lessen harms and prevent future risk	<ul style="list-style-type: none"> • Enhanced primary care • Behavioral parent training programs • Treatment to lessen harms of abuse and neglect exposure • Treatment to prevent problem behavior and later involvement in violence.

<https://www.cdc.gov/violenceprevention/childabuseandneglect/prevention.html>

The proportion of homicides committed by use of a firearm increases as a child's age increases. Homicides occur at a disproportionate rate among Kentucky's black children with homicide being the second leading cause of death. The homicide rate among Kentucky's black children is approximately eight times greater than the rate for Kentucky's white children.

Parents are encouraged to:

- Never leave a gun unattended when handling or cleaning.
- Inform children about guns and gun safety.
- Never allow a child to touch a gun unless under strict supervision.
- Know children's friends that have guns in their homes and how they are stored.
- Lock all guns in a gun safe – hiding them is not enough.

The American Academy of Pediatrics advises the safest home for a child is one without firearms. However, if there is a firearm in the home, proper storage can help keep children of all ages safe. The American Academy of Pediatrics recommends that a firearm be:

- Stored, unloaded, and locked in a cabinet, firearm safe, vault, or lock box.
- Ammunition should be stored in a separate place.
- Keys to the locked storage are hidden.

Proper storage of a firearm is extremely important for homes with children. Easy access to firearms increases children's risk of being killed or injured by a firearm. In fact, the risk of dying by suicide is 4 to

10 times higher in homes with firearms.²⁶ Everyday, 78 children, teens, and young adults are injured or killed by firearms in the US.²⁵

The ASK (Asking Saves Kids) Campaign promotes parents and caregivers asking, “Is there an unlocked gun in your home?” before sending your child over to play. On ASK Day (June 21st), the American Academy of Pediatrics urges parents to ask this important question to keep kids safe.

As part of the funded best practice packages, local health departments have focused efforts toward firearm safety in their communities. The Madison County Sheriff’s Office provided firearm safety education to approximately 1,200 elementary aged students, along with many parents and teachers. The Madison County Extension Service provides hunter safety courses and firearm safety for court ordered parenting classes. The Lexington Fayette County Health Department provided firearm locks and education as part of the National ASK Day on June 21, 2018. Hopkins County shared firearm safety information at Back to School events at 14 different schools.

Firearm violence is a public health epidemic that is injuring and killing children at alarming rates. Common-sense solutions that have been proven to reduce these injuries and deaths must be implemented.

Homicide Initiatives



The mission of Prevent Child Abuse Kentucky is to prevent the abuse and neglect of Kentucky’s children by providing community programs, public education, and advocacy.

Additional information can be found at <https://www.pcaky.org>.



Kentucky’s Department for Community Based Services, Division of Protection and Permanency reviews child abuse and neglect cases to understand the complex factors present in families and children served by the agency. DCBS offers a wide variety of trainings for parents, staff, and community partners to help prevent child abuse and neglect among Kentucky’s children. Representatives from DCBS collaborate with MCH with presentations at regional conferences, joint resource and referrals, and serves on local and state child fatality teams.



The Kentucky State Police participates on the child fatality review teams at the local community and state level. The Safe Schools Program promotes public safety through service, integrity, and professionalism utilizing partnerships to prevent, reduce, and deter crime and the fear of crime; enhance highway safety through education and enforcement; and safeguard property and protect individual rights.

Drowning Prevention

The Centers for Disease Control and Prevention recommend the following tips to prevent drowning:

Learn life-saving skills	Teach children how to swim and other water skills. Teens and adults should learn cardiopulmonary resuscitation (CPR).
Fence it off	Around backyard swimming pools, install four-sided isolation fences, with self-closing and self-latching gates that open away from the pool area. Pool fences should completely separate the house and play area from the pool.
Make life jackets a must	Children should wear life jackets in and around natural bodies of water, such as lakes, rivers, and oceans, even if they know how to swim. Life jackets can be used in pool settings for weaker swimmers.
Be on the look out	When children are in or near water, including bathtubs, closely supervise them at all times. Adults supervising children in or near water should avoid distractions such as reading, playing cards, talking on the phone, and using alcohol or drugs.

Drowning prevention education and activities are included in the MCH general injury prevention package for local health departments. The Kentucky Injury Prevention and Research Center developed an age specific safety interventions module to prevent injuries and death, "[Water Safety: An Overview of the Problem of Drowning and Useful Interventions.](#)"

Poisoning Prevention

Children are poisoned by in home items such as household cleaners, laundry detergents, medications, hygiene items such as shampoo, and automobile fluids such as gas or oil. Prevention efforts require childproofing the home to keep these items out of reach from toddlers, young children, and adolescents.

Poisoning Initiatives



The Kentucky Poison Control Center serves all 120 counties in Kentucky by providing trained staff to answer questions and respond to emergencies involving possible poisonings 24 hours a day. FindHelpNowKY.org is a real-time substance use disorder treatment availability locator and information center for Kentucky.

If someone needs to talk about treatment for substance use disorder, they can call **1-833-8KY-HELP**.

Prevention tips for toddlers and younger children

- Keep cleaners and other toxic products out of reach.
- Check your purse for potential hazards.
- Use original, child-resistant packaging.
- Keep medicines up and away.
- Put the poison help number in your phone.
- Check for lead.
- Install carbon monoxide alarms.

Prevention tips for Adolescents

- Know what teens are using.
- Dispose of unused medications.
- Store medications and alcohol where teens do not have access.
- Talk to teens about alcohol use and drug use.
- Be aware of signs of suicide.
- Implement protective factors – help the teen to gain balance in life. Offer structure, limitations, and clear communication.

Fire Initiatives



The Kentucky State Fire Marshal has worked closely with the Kentucky Injury Prevention and Research Center along with Kentucky Safe Kids to promote the use of smoke alarms and other fire safety initiatives.

The Kentucky Firefighter's Association (KFA) was established in 1919 to support firefighters of Kentucky and to improve fire service in the Commonwealth.



Kentucky Injury Prevention and Research Center addresses issues concerning fire safety by providing and installing smoke alarms and assisting with the development of fire escape plans. Educational opportunities are offered to everyone from children to those in the workforce on fire safety and prevention strategies.

Fire Prevention



Look for places fire could start.

Listen for the sound of the smoke alarm.

Learn two ways out of every room.

1



Keep anything that can catch fire away from your stovetop.

2



All heaters need space. Keep anything that can burn at least 3 feet from heating equipment.

3



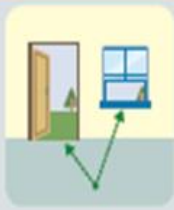
Make sure everyone in your home knows the alarm sound and what to do if they hear it.

4



Find two ways out of every room.

5



Make sure doors and windows are not blocked.

6



Get outside to your meeting place.

For more information, visit: www.usfa.fema.gov and www.nfpa.org.

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